THE FARMERS' REGISTER.

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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

For the Farmers' Register.

OBSERVATIONS ON THE LOW WAGES OF FEMALE LABORERS.—No. 1.

The general depression of the wages of laboring females in this country, and the peculiar circumstances which condemn to unceasing toil, and severe privation, so large and meritorious a portion of the whole community, are subjects which well deserve the consideration of every one who has a share in the general interest. It is not only a matter calling for the action of the philanthropist—but it also has an important bearing on the public economy and national wealth; and *may affect*, if it does not already threaten, the private interest and family affections of every individual. This is as yet a country of plenty—one in which the industrious laboring man cannot fail to earn the necessaries of life, and in which the labor of a day will generally suffice to provide the bare necessaries of life for a week. Yet not content with the wages which demand and fair competition will always properly adjust, nothing is now heard of in the northern cities but the combinations, and "*strikes*," of bodies of laborers, and the resort to every means of intimidation, to enforce their unjust and lawless claims for higher wages, or for reduced hours of labor. It is not designed here to consider the operation of these combinations, or to show that, even when successful, the consequences would be injurious to those who seek benefit from them, as well as to their employers and to the community at large. The conduct of these full-fed, yet discontented and riotous laborers, is merely here named to be contrasted with the condition of the thousands of females, who, in silence and in hunger, and under fears of still greater miseries in future, labor incessantly to prolong a wretched existence. Why should such a difference in the rewards for labor exist, and be increasing in degree, between the two sexes? And are there no proper means of removing, or at least of alleviating the evil as it regards women?

Benevolent and public spirited men have recently taken this subject into consideration, and have commenced acting, with more zeal perhaps than discretion. It is feared that their efforts are not properly directed, and will therefore produce no permanent or beneficial result. Public meetings have been called, in Philadelphia, of the laboring females, and reports of the existing grievances have been ordered—resolutions entered into of the propriety and necessity of increasing wages, and a plan devised (as is inferred from the imperfect and concise statements in the newspapers,) for forming associations of females, like the "trade's unions" of men, to combine their wishes, and to *enforce* their demands. All this will be ineffectual—and much worse than merely ineffectual. The assembling of females in public meetings, is a violent departure from the retiring modesty which has heretofore distinguished our country women, the poor no less than the rich. By previous habits they are unfitted (and long may they remain so,) to take part in public deliberation and action. Even were it otherwise, combinations of females cannot possibly *compel* an advance of wages, as is often attempted and effected by associations of men—and if they could, the results would be liable to the same general objections. Without drawing together, for public gaze, thousands of the sufferers, it would be as easy to ascertain and make public their cruel oppressions. As to any number of individuals, resolving that they will pay higher wages, and adhereing to that course, it would merely operate as charitable gifts to particular persons, and could have no effect in curing the general evil. To do this, the causes must be removed: the evil must be attacked, not at the latest shoots of its branches, but at its root—which will be found in the habits and institutions of society in this country.

Why is it that, while mechanics generally in our towns can earn at least $1 for 10 hours labor, very many of the most industrious and competent female laborers, or mechanics, for 15 hours work, seldom earn one-fourth, if indeed one-eighth as much? The answer would be ready, if the occupations were such as to require the whole strength of a healthy man. But this is very rarely the case. In most kinds of mechanical labor, skill, dexterity, and patience, are more required than mere physical force—and women, if employed, would as well or even better than men, execute the same labors, and deserve at least as high rewards. But the misfortune is, that while every mechanical employment, save two or three, (those of milliners and mantua makers are perhaps the only exceptions,) are open to men, women in Virginia, and wherever manufactures are not in extensive operation, are confined almost entirely to sewing. There are at least as many poor women as of poor men—and the labor of half of all the portion of the community dependent on labor for bread, is *not only forced into one single employment, but is driven from the most profitable part of that employment, to make way for the other sex.* Men's clothes, by usage and fashion, have been almost entirely given up to be made by males—and in many cases, the male merely receives the price, while females, for a small proportion of it, actually perform the whole labor.

Now suppose that the tyranny of law, or of custom or fashion, of religious prejudice, or any thing whatever, compelled a very large proportion of the laboring men to confine their efforts to a business which one-third of their number could as well execute: would it not be a certain consequence that their competition and urgent necessities would depress their wages to the lowest possible state? If 20,000 shoemakers were enough to supply the wants of our country, and 40,000 other persons were compelled to make shoes, or to be deprived of all other employment, it is evident that the wages for this kind of labor, would be reduced as low as are now those of poor female seamstresses; shoemakers, almost without exception, would be reduced to the greatest necessity and state of suffering. If the proper and

necessary number of the trade (which was supposed to be 20,000,) could have effectually combined, or any portions of them, to raise wages, it is as obvious as it is certain, that it could not be done when thrice that number had to share the employment and the wages, and were almost starving on the insufficient dividend. Therefore, combinations of women to compel the raising of the wages will be altogether ineffectual, as all such combinations are altogether wrong, and injurious in their tendency.

But the main reliance seems to be, that the persons who pay these stinted wages of labor, may be impressed with the enormity of the grievance, and voluntarily consent to increase them to a fair and reasonable demand. Doubtless many individuals are ready to yield to such promptings of benevolent feeling: but however numerous the cases may be, and however liberal may be the advance made on previous prices, the remedy for suffering will be but slight, and no remedy whatever will thereby be offered for the real evil—that is, the general and fixed depressed prices for female labor. By possibility, thousands of individuals may be induced to pay double prices, (and double prices would be required at least,) as wages for the employment which their private and personal demands would create—and thousands of deserving workwomen might thereby obtain a fair recompense for their toil, and an exemption from their previous sufferings. But even the occurrence of this rare (not to say impossible) exercise of charity, would not benefit the still greater number, who were not so favored by other employers—and indeed, would rather cause them increased injury. And no confidence could be placed in the permanency of even the very partial relief that would be afforded. It is an established truth, that prices for labor, as for commodities, will always be regulated by the proportion of supply and demand—and that they never can be materially affected, nor for any length of time, by any other considerations than the *interest* of the contracting parties. Laborers, as a body, will always take as high wages as they can obtain—and their employers will give no higher than the lowest which will suffice to command the services required. This general operation of such causes, if properly considered, will show that no relief can be hoped from any voluntary offers of increased wages.

The remarks which have been submitted, apply more particularly to the state of society in Virginia, and other parts of the United States where there are few or no factories which call for female laborers. When such factories are introduced extensively, they extend the field of woman's labor, and serve to increase their wages—at least in the beginning. But it is found, ultimately, that one evil has only been exchanged for others of not less weight. However, it is not intended here to enter upon the consideration of such changes in habits and industry—but only of society and habits as existing in a community not much advanced in manufactures.

Except in towns, it is literally the case in Virginia, that poor females have no employment whatever, by which they can gain wages, but in sewing. Weaving and knitting formerly furnished more employment, but now scarcely any worth naming, on account of the improvements in weaving on a large scale, and the consequent reduction of price. As the small proportion of sewing which is shared among the many who would gladly be employed, would not suffice for one-fourth of the hands, it follows that three-fourths of their time, on the general average, these laborers are without employment, and cannot obtain it even at the lowest pittance which is even paid for it. These females are often as respectable and as deserving as any of the more wealthy—and who are indebted to the kindness of some relative or friend for a home, where if they eat the bread of dependence, it is at least received from kind hands. Without such aid, and with nothing but their wages of labor to sustain them, thousands of such females would starve, or be driven to live on public charity. Many among these are the widows or orphan daughters of highly respectable men—many even of men who had enjoyed wealth. And there is not a farmer in Virginia, whether rich or poor, who can feel sure that in two generations, if not in one, that some of his female descendents will not be in the same deplorable situation: a situation to a sensitive mind, which cannot be otherwise than most galling and distressing, however tempered and alleviated by kindness and affection. A state of dependence, when not so alleviated, condemns the poor woman to the unremitting toil of the day laborer, without his wages—to the subjection of the slave, without his freedom from care and mental suffering. This is the situation, in its various grades, in which thousands of the most industrious, virtuous, and deserving part of our population are placed—and the danger of which is pending over as many others, who are now growing up in hope and joy, cherished by affection, and supplied with every present comfort. And the beings who are condemned to this state, and who succeed each other in endless succession, and increasing in numbers and in wretchedness, form a portion, (and an equally deserving portion) of the "better half of the human race"—who as a class, are flattered, almost adored by men, and yet denied by their usages and institutions, the means of earning honest bread, and in numerous cases, are deprived of all the means of subsisting, except in a worse than slavish state of dependence—or in a life of infamy.

If we were neither husbands nor fathers—if we cared nothing for the situation of unfortunate females who are not connected with us by ties of relationship—still as members of the community, all men have a deep interest that so much of the country's capital of labor and talent, should not be kept idle and useless, and a source of expense, instead of profit and wealth to the nation.

POLECON.

July 3rd, 1835.

[Deeming that (for the present time) enough of argumentative writing against the policy of the existing law of enclosures, has been given to our readers, we have withheld from publication more than one such communication recently received. A similar course would have been pursued with regard to the following, but for the matters of practice contained, which present a different kind of claim to notice. The experiments would have been of more value as examples, however, if authenticated by the author's

name, and would have served his purpose better as proofs of the positions maintained.]

For the Farmers' Register.

A WORD TO "FENCEMORE,"

Who in the May No. of the Register, Vol. III. page 47, "insists that agricultural reform calls for no legislative enactment—that the existing legal policy" (as regards fences) "throws no obstruction whatever in the way of the individual who sincerely wishes to place his stock management upon a profitable footing, and that he feels constrained to condemn all such attempts on the part of the legislature as gratuitous and uncalled for, and as oppressive in the extreme to the whole body of small farmers, who constitute so large a portion of the agricultural community."

"Agricultural reform calls for no legislative enactment"—and Fencemore seems to think that he has satisfactorily established this proposition, because he has adjudged that he would do better with just *double* the quantity of fencing now used—and as we are now *compelled by law* to have a certain extent of fencing, he would by no means remove this *compulsory enactment*, least, as it would seem, we should attempt to do with *less*, when it is his opinion we ought to have *more*. It matters not what other honest farmers may think, or to what conclusions their arithmetic may lead them. The *true interest* of the farmer, and his *sagacity* in pursuing it, is not enough to direct him in the management of his own private affairs—he must be made to keep up his fencing about his arable lands at all events, by "*legislative enactment.*" Fencemore has demonstrated arithmetically (if indeed he has demonstrated any thing) that it will take as great an extent of fencing to enclose a proper number of lots for standing pasture and other purposes, upon an improving system, as is now used for the outside enclosure of our arable lands—and thus as nothing could be gained in the actual amount of fencing, supposing the present law of enclosures modified, (which by the by we do not believe) he concludes that nothing can be gained in any way—or because we should have to make fences around a few lots for pasture and improvement, we had as well make them around our whole plantations! Thus doubling our amount of fencing, and for what? Why, according to Fencemore, to keep "the country from being thrown into consternation and dismay by a drove of hogs or bullocks!!" Or at another place, because "it would be oppressive in the extreme to the whole body of small farmers," for the legislature to take away from them the power to turn their hogs and cows on their neighbors' fenceless crops. Or again, because "the annual *clearings* of the tobacco planter are utterly inadequate to his immediate demands," this tobacco planter must therefore be permitted to use the woods as a range for his stock, having no open land; thus entailing upon his neighbor, perhaps a cotton planter, with an abundance of pasture of his own, the enormous expense of keeping up double as much fencing as he ought to have, solely for the benefit of the tobacco planter's half-starved hogs and cows. This argument of Fencemore seems to us to afford but a poor "defence of the law of enclosures"—and we think it will be found to weigh still lighter against a few *stubborn facts* which we are now going to state, and which we think ought to go farther than arithmetic with the "whole body of small farmers," and that of the big ones too, to prove that it would be best for every man to live upon his own land, and within his own fences.

First. A few years past an ox was put into an old barn about the first of December—kept well littered and fed till the first of March following. Upon hauling out the manure, it was found that that taken from the barn was equal to that made by six of the *out cattle* at the pens; and it is believed to have possessed twice the strength that the pen manure did.

Second. Several winters past, six cows were milked—fed in the usual way with dry shucks scattered over the pen. The next winter two only were milked—fed throughout the winter upon one quart of meal each, morning and night, mixed with cut shucks, and wet with salt water. These last two gave *more* milk, and that richer, than the six gave the winter before. The next winter, but one cow was kept to milk, which was well fed with meal, cut shucks, and a few cotton seed. Her calf was killed, and she was milked three times each day. She gave nearly or quite as much milk as the two, or the six before kept gave, and was turned out in the spring quite fat.

Third. In the spring of 1834, ten shoats were put into a small pen, and fed through the summer upon clover cut from half an acre of land, together with one ear of corn each every day. They kept in good order, and at fattening time in the fall, were found in better order, and fattened upon less corn, than those that ran at large; although these had the same quantity of corn each day whilst out—one-eighth of these last having died from the time the ten shoats were put up. When killed and weighed, the ten hogs which had been put up in the spring as shoats, of the same size and age as these which were running at large, weighed from 27 to 35 pounds, each, more than the hogs which these last made, although fattened in the same manner. It was moreover observed, that at least *six times* as much time was required to look after the *out* hogs, as was required to feed and water those in the *pen*.

By these experiments then it would seem that we in fact gain nothing by permitting our stock to run at large, even as regards *their benefit*, to say nothing of the enormous expense which the present *ad libitum* system, as regards stock, entails upon the whole agricultural community. We have just seen that one cow tolerably well kept upon a man's own land, and within his own fences, is worth six running at large—that it will make him *more manure* than six—will be a finer animal than any of the others, and will bring him better calves. That his hogs may be kept up upon the same amount of corn; and with the addition of a little clover, will keep fatter, grow larger, be less apt to die; to be killed or stolen, and will give him more meat, and be fattened upon less corn than the same number running at large. And above all that time which, with industry, is a poor man's capital, is saved to him in the ratio of six to one, when he keeps up his hogs.

FENCE LESS.

June 30th, 1835.

GYPSUM NOT INJURED AS MANURE BY BEING HEATED.

To the Editor of the Farmers' Register.

Fairfield District, S. C., July 11th, 1835.

Impressed with the justness of a remark of yours, that "information obtained from statements in detail of agricultural experiments, is far more satisfactory to the attentive and laborious inquirer, than a mere report of the general opinions of the experimenter," and in accordance with that spirit, I now offer you a brief account of an experiment, which perhaps may not be uninteresting.

In the spring of 1834, intending to plaster a lot of orchard grass, I ordered a few barrels of gypsum from Charleston. As I had before found the process of pulverizing the stone rather troublesome, I requested my factor to purchase the gypsum already ground into powder. When the gypsum arrived, I was astonished at the high price it had cost me, to wit, six dollars per barrel; but not suspecting the judgement of my factor as to the quality of the article, I made no examination of it myself, but placed it entirely to the account of imposition. In June I had it spread over the grass at the rate of one bushel per acre. The very next day after having spread it, a plasterer who it seems had previously examined the plaster, called on me to ask the favor, as the article was not to be had in the Columbia market, of a barrel of it, to finish a job of stucco-work in which he was then engaged. I told him there was still a barrel on hand which he might have, but that it was raw gypsum, and that he would have to put it through the process called "boiling," before he could use it. He replied that it had already gone through that process, and was excellent plaster for his work. I denied the fact, as I had bought it for simply ground gypsum. He, however, instantly undeceived me; and convinced me, by working a little of it into plaster, that he was right; upon which he took the barrel, with which he finished his job of stucco-work.

As I had never seen any account of the application of gypsum in aid of vegetation that had undergone the process of heating, it at once occurred to me that I had probably destroyed my lot of grass. Reflecting a moment, however, upon the effect of heat upon gypsum, it was obvious that it had undergone no essential change in its component principles, except the expulsion of the water of composition. It was still the sulphate of lime in a more concentrated and condensed state; and as in this state its avidity for water is so prodigiously great, I concluded the first rain, or perhaps the dews, would soon saturate it, and re-convert it into its natural state of gypsum; and, therefore, I could not conceive how it could injure the grass, unless from an over-dose of gypsum in consequence of its greater strength to the bushel, of which I felt but little apprehension. In a few days afterwards, upon receiving one of the numbers of your Register, I was gratified to find you had opened a discussion upon the same subject, the first which I had ever seen; and so far, in the absence of any experiment, the same conclusion had been arrived at by yourself.

My accidental experiment, however, I think goes far towards settling the question. The grass never showed any signs of unhealthiness, or suffered in any way for a moment; but on the contrary, from the manner it sustained one of the severest droughts ever witnessed in August, and again the unparalleled cold of the last winter, and the manner in which it has subsequently flourished, and retained its verdure, I am satisfied the mistake was all in favor of the grass. I had applied gypsum to a part of the same lot in June of the year preceding. The benefits were very manifest, but not equal to those from the last plastering. In 1832, I applied it at the rate of about one bushel per acre of unheated gypsum, and it was my intention to apply only one bushel per acre in 1834; but by the mistake, as gypsum contains 22 per cent. of water, which had been driven off, I of course applied what was equal to one bushel and nearly a quarter of the unheated article; which the result has shown was not too much.

The great objection then to the application of gypsum that has undergone the process of heating, as a fertilizing substance, consists in the expense, and not in any deleterious or impaired qualities of it—which expense at the rate I paid, was far too great. The heated plaster cost me about two dollars per bushel, whilst I never paid higher than ten dollars per ton in Charleston for the gypsum in stone, and have bought it as low as seven dollars.

J. D.

P. S. As it is satisfactory, and generally useful to know all the circumstances attending an experiment, I will mention that the lot on which my grass grows is new land, on a ridge of pretty good soil, with a growth of oak and hickory, in Fairfield District. It is what we call clay soil mixed with a good deal of feldspar stones; but sufficiently silicious to be easy of cultivation. It is shaded by the natural growth of lofty oaks, &c., left standing about 50 and 60 feet apart. It has had no manure except two annual supplies of cotton seed, spread at the rate of two wagon loads (45 bushels each) to the acre. The grass is flourishing and profitable.

J. D.

From the Claremont National Eagle.

CANADA PLUMS.

The plum trees all over this section of the state and in the adjoining parts of Vermont present a most singular appearance. The fruit at this point of the season, unless injured in some way, should be about the size of a pea—perhaps not so large. But the fruit every where presents a most unnatural size, presenting rather the appearance of green lemons than anything else we can remember, swollen, wrinkled, and puffed up, some long, others round, an inch long and nearly as thick. They are of a bright green or yellow color, tinged with a beautiful scarlet on the outside, while they are completely empty within. This fruit—the large red plum—in the natural course of vegetation is at this time, as we remarked, about the size of a pea; and those who have plum trees, as there are many on the Connecticut, are exceedingly puzzled to account for this state of things. We had a branch brought to this office from Cornish which really has a very curious and singular appearance. We are informed the trees have some ten years

back suffered in the same way, but the cause is a mystery. Nothing like a worm is to be found in the swollen fruit.

From the United States Philadelphia Gazette.

YOUNG'S PATENT SPARK CATCHER FOR LOCOMOTIVE ENGINES.

Mr. Editor—At a time like the present, when the extension of rail roads throughout our country is becoming so general, and the employment of locomotive engines has become a matter of course, I deem it important that all persons connected with the management of rail roads should be made acquainted with the fact, that a complete remedy exists for the greatest nuisance to which this mode of travelling is liable, viz: the emission of sparks from the engine. That remedy is to be found in the contrivance with the name of which this article is headed, and the patentee is prepared to dispose of the right of using it, either at a reasonable rate for each engine, or at a gross sum, to be paid for the privilege by each company that may be desirous of availing itself of his invention.

It is now upwards of two years since the spark catcher of Mr. Young* has been in use on the New-Castle and Frenchtown rail road, since which period no instance has occurred on that road of a single garment having had a hole burnt in it by a spark from a locomotive engine. Of the tens of thousands of persons who have travelled the New-Castle road during the period named, not one can be found to gainsay the above statement.

Is there a single person, who has travelled on any other road in the United States, on which locomotives are used, with wood for fuel, that has not been annoyed, and either had his flesh or clothing burnt during his journey, by the means I have mentioned? I do not believe there is one to be found.

Is the Camden and Amboy road free from the intolerable and dangerous annoyance? No!—Baggage cars have been burnt, passenger cars have been on fire, and ladies almost denuded.

Is the great thorough fare of Pennsylvania, the Columbia rail road, free from it? No! Barns, wood, crops of grain, and fences, have fallen beneath the flames in turn.

Are the Philadelphia and Trenton, the Philadelphia and Germantown—in a word, are any of our rail roads in the whole country, from Maine to Louisiana, provided against the inconvenience and danger of which I am speaking? No! not one.

We have arrived then at this point; the greatest drawback to the pleasure and safety of travelling on rail roads with locomotive engines, is fire emitted from the chimnies of the engines, and against this a perfect preventive exists, the right to use which may be obtained by any company that see proper to purchase it, at a reasonable price. One company only in the United States has availed itself of it. The question for the public to decide is, whether they will suffer this sort of carelessness or false economy to prevail in rail road boards any longer, and allow their own property and lives, and those of their wives and children, to be jeoparded, or whether they will resolve with one accord to prosecute in all cases of damage the company that undertakes to convey them safely without taking the proper precautions to do so.

The writer of this article is as ardently attached to the rail road system as any man in the country. He has long looked on the monstrous abuse, he is now noticing, in silence, but a solemn sense of duty, quickened by a recent signal illustration of the danger to which life is subjected by neglect in guarding against the particular evil of fire, has at length urged him to break his silence.

And I hope that this brief notice may induce a general attention to the subject, which is one, in my humble judgement, of paramount importance both to the corporations alluded to, and the public.

One word more. The assertion is distinctly made, and all contradiction of it defied, that Young's Spark Catchers are a perfect preventive to the emission of sparks from the chimnies of locomotive engines when in use. I believe it might be asserted with equal safety, that no other contrivance has been found to answer at all.

L.

June 16th.

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* Mr. Young is the engineer of locomotive power on the New-Castle and Frenchtown road, and resides at New-Castle.

TO DESTROY LICE ON CATTLE.

To the Editor of the Farmers' Register.

In the June number of the Register, I perceive several modes recommended for destroying lice on cattle, each perhaps, efficacious, but with some objections: and as we cannot have too many remedies for the destruction of that pestiferous insect, allow me to recommend the use of a little flour of sulphur, given internally, once or twice a week, with salt, which is eaten kindly. This I have practised with great success.

In addition to the beneficial result in destroying the lice, it has the happiest effect on the general health of the cattle.

H. H. C.

For the Farmers' Register.

SUPPOSED MISTAKE AS TO HESSIAN FLY.

Essex, July 22, 1835.

From the severity of the winter and the destruction by what we term the fly, our crops of wheat are reduced to about one-third of a crop. I have, on examining the stalks of wheat during the spring, seen a great number of deposites near the root; and at the approach of summer I found they had all matured, and deserted their winter quarters. I have looked diligently for the Hessian fly, but can see nothing but an innumerable quantity of grasshoppers of the smallest size. Indeed from the slight observations which I have made on this subject, I am brought to the conclusion, that we may probably be condemning the one for the fault of the other. I would beg, therefore, should any of the writers for the Register make a farther experiment with this deposite, that they will keep the insect till they are thoroughly convinced whether in fact it be the Hessian fly or not, for between the grasshopper in its youngest state,

and the Hessian fly, there is a striking resemblance.

H. H. R.

EXPERIMENTS WITH LIME AS MANURE.

To the Editor of the Farmers' Register.

Norfolk Co., July 6th, 1835.

In my first acquaintance with the use of lime, I was almost driven from a further trial of it, by its contrary effects; but I candidly admit that my expectations were founded upon gross ignorance of the proper manner of using it, for I ought not, upon neither rational nor scientific principles, to have expected a different effect after the manner of use.

I will give you a history of my mode of application and its effects, if you can have patience enough to follow me, for I really expect you to be, tired reading such crude unpolished stuff as I am truly ashamed of myself: but the experiment is correct. If my pen has a poor faculty of relating it, your repeated assurances that doctrines when founded upon correct observation, was the greater object of your solicitude even if clad in homespun language, have spurred me onward to give you this desultory statement. In the spring of 1834, a very poor lot of land containing 15 acres, rather on the sandy order, what is termed by your Essay a sandy loam, was divided in two equal lots of 7½ acres each, both to be seeded in red clover to experiment from, with lime and plaster separately. As my knowledge of the effect of either, was rather vague and visionary, I determined to improve it if I had to pay rather dear for my whistle. Consequently 500 bushels of well burned shells was set apart for the lot for liming, and from 20 to 25 bushels of ground plaster was set aside for the lot for plastering. After the lot for lime received its first fallowing, it was checked off carefully at different distances so as to vary the quantity when spread from 40 to 120 bushels per acre, a bushel of the shells was put down in each check, and carefully covered over with earth until they had perfectly slaked, and then spread as regularly over the surface as possible. The other lot received a light broad cast of rich dunghill earth, and seeded both lots about the middle of February in red clover, prepared as neatly as a harrow and roller could do it. In March following, the lot destined for plaster, received its first due 1½ bushels to the acre sowed on a damp day, and the next plastering after the first cutting of clover was taken from it: the two lots were left to time and seasons to unfold their wonders. The limed lot with a good grass season did manage to admonish the passer-by that red clover seed had been sown there. The other yielded in the month of July, a very fine cutting of hay. So much for my first attempt. The difference was so very striking that it awakened in me an anxious inquiry. I commenced to read—for until then I looked upon a book on agriculture, like the laymen did the Bible in the darkest days of popery, to be touched at the risk of ruin. I had embraced the ruinous idea so common, and yet so fatal to my countrymen, that book knowledge was prejudicial to profitable husbandry: but I soon detected my error, and determined to carry my experiment with lime still farther. So, last October I carted on the lot 500 loads of good farm pen litter, and spread it broad cast, then seeded it again with wheat and red clover at the rate of 1½ bushels of wheat and 5 quarts of red clover seed to the acre. Now comes the bright side of the picture. The wheat (on land before almost too poor to produce any thing) stood on an average, from 5 to 6 feet high (though a very bad season for wheat;) and I verily believe, could it have been prevented from falling down, the yield would have been from 175 to 200 bushels. I know not the exact quantity I have saved, not having yet thrashed it all out, but it will not fall much short of 175 bushels, and the waste was considerable. The clover bids fair to excel the other lot, though the yield from the plastered lot was not inconsiderable, as the first cutting this season averaged from three to four feet in height, and is now fit for the scythe again. So much for lime and plaster. Many of my neighbors when passing these lots look puzzled. The cloud of ignorance which has so long obscured Eastern Virginia is gradually disappearing before the effulgent rays of your agricultural pioneer the Farmers' Register, for such I hail it in this section of the country.

Whilst my hand is in I will give you some account of a small crop of corn which I have growing, and for a more appropriate name will call it the experiment crop. I do not expect this to excel or even to compete with overgrown crops that have been made at the north; because the number of stalks to the acre is not great enough to afford the requisite number of ears: but I am not so certain but what corn might be planted thick enough to afford to the acre as great a product as has been raised at any other place. The land the crop is now growing on, was originally very poor, but was made rich for a crop of the skinless oat: being disappointed in obtaining them, I determined to plant it in the extra prolific or twin corn, which is said to produce from five to eight ears to the stalk. The corn was planted on a deep trench filled with rich dunghill earth three feet by eighteen inches, and the corn covered with an equal combination of leeched and unleeched ashes: it was with great difficulty that the corn was made to stand from the caustic effects of the ashes, but the whole is growing finely and bids fair to produce well. If it does not suffer from being too thick, the yield must be considerable: the result, if deserving of public notice, you shall hear as soon as ascertained.

A. S. F.

From communications to the Board of Agriculture.

OBSERVATIONS ON THE UNITED STATES OF AMERICA.

By William Strickland, Esq. of Yorkshire. Received 8th March, 1796.

[Concluded from p. 211 Vol. 3.]

VIRGINIA

Is the southern limits of my information in America; beyond it inquiries were unnecessary, because it appears as if agriculture had there already arrived at its lowest state of degradation.

The usual crops, in this state, are maize and wheat alternately, as long as the land will produce them tolerably well; then in future after the two crops, three or four years rubbish pasture; and in

parts where tobacco is cultivated, several crops of it are taken on first clearing the ground, before any grain is sown upon it; now and then a crop of oats intervenes, perhaps instead of wheat, perhaps following it; clover and lucern are yet little known, though there is reason for supposing that they would be as beneficial here, as the first is, in the other states, or perhaps more so; since, on account of the increasing heat of the climate, pastures and meadows are more precarious, and less frequent. Where crops of wheat, of not more than five or six bushels per acre, are expected, it is not usual to sow more than half a bushel of seed, and no where in this state more than one bushel. The average of all that part of Virginia lying east of the Blue Ridge, I am satisfied I state at the utmost, at seven bushels per acre; no one states the average of that extensive flat country in Virginia, lying below the head of the tide, at more than five or six bushels; it therefore requires much better crops in that naturally fertile, but worn out, and not extensive tract of red land, at the foot of the mountains, to raise the average to seven bushels. In those fertile and beautiful vallies that lie among the mountains, in which ignorant cultivators have not yet resided sufficiently long to have entirely exhausted the soil, favored with a temperate and delightful climate, it yet produces crops equal to any in America; I have reason to believe not less than twelve bushels per acre; but the surface, capable of cultivation, when compared with the rest of Virginia, is very small indeed: with the country beyond them I am unacquainted. The average of maize, in the eastern part of Virginia, is not to be reckoned at more than fifteen bushels; of the vallies, at twenty bushels; of oats, from one and a half to two bushels of seed to the acre, will be a return of from twenty to thirty.

All the back country of America is very favorable to the growth of rye; crops, producing from twenty to thirty bushels, are commonly met with; this grain is entirely consumed in the distillation of whisky, chiefly for the consumption of the Irish frontier-men, except among the Germans in Pennsylvania, who use it for bread.

Much of the wheat of this state is of a very inferior quality, some so bad as scarcely to be of any use, though that which is good, naturally much resembles the wheat of Maryland; but the slovenly management of the farmers considerably lessens the value of it.

The use of the flail is scarce known here; almost all the wheat is trodden out in the field by horses upon the bare sandy soil, with which much of it gets incorporated, and afterwards is separated from it by sieves, or some other means that answer the purpose; the consequence of this is, that a considerable quantity of dust adheres to the surface of the grain, and insinuates itself into the groove on one side of it, so that no art can entirely clear it away; and thence I am told millers are unable to make superfine flour from Virginian wheat; and on that account, that it bears a price, inferior to what the quality would otherwise demand. A weevil, or some other insect, greatly infests the wheat of this state when in the straw, which makes it necessary to tread it out as soon as possible after harvest; and this is frequently attended with inconvenience and loss. In unloading the wheat of this state from shipboard, or otherwise working among it in the granaries, the people employed are frequently so affected with a *prickling* or *nettling* on the skin, as to be unable to go on with their work, but without being able to account for the cause of it. I recollect a similar circumstance happening, in unloading a vessel laden with Virginian wheat, some years since at Liverpool, when it was said to be caused by a minute insect. Oats are not extensively cultivated in any part of America, and are every where bad, but those of this state, of the worst possible quality; they have certainly kernel sufficient to enable them to vegetate, but are, notwithstanding, light as chaff. The cultivated oat appears again returning to the original grass. I never saw any oats that would be marketable in England, except some in the German tract in Pennsylvania, and they would admit of comparison with such only as we should esteem very moderate.

I am unable to discover how profit is to be derived from such crops, unless, that people being actually possessed of the soil, and of the slaves to cultivate it, abandoning all expectation of profit for their capital, look upon all as nett profit that is received from the land. The land owners in this state are, with few exceptions, in low circumstances; the inferior rank of them wretched in the extreme. The evils of slavery are now rapidly and forcibly recoiling from the slave upon his owner. Tobacco and maize, which heretofore have been the curse of the slaves, are now, with the slaves, allowed by all men in Virginia, to have been the ruin of themselves and their country: the almost total want of capital, among this description of people, forbids all improvement on a great scale, and want of the knowledge of agriculture, prevents its slow but certain progress. To show what some of this land would submit to before it became exhausted, and the mode pursued to accomplish it, I will take the cultivation of a gentleman, possessing a considerable tract of land, originally as fertile as any in nature, on the foot of the Blue Ridge, who complained that much of his estate was worn out. After clearing and burning the woods, seven crops of tobacco were taken, in as many years; in some instances, ten crops; four crops of wheat; and ten crops of maize and wheat alternately, in ten years. After twenty-one years, the land refused to yield any more grain; but in a twelvemonth, too benignant nature clothed his property with a matchless sheet of white clover.

To such modes of cropping, the poverty of the people, and sterility of the soil must be attributed: crops may be seen where each ear, frightened at its neighbor, keeps that awful distance, which would admit of a person's walking through the field without breaking down a stalk, in a climate and soil well calculated for the produce of wheat. In many of the states, the Hessian fly bears the blame, which, if properly placed, ought to stand to the account of the ignorant and greedy land owner; but no one pretends to say, that this insect has committed any material (if any) depredations on this state.

RECAPITULATION.

	Average produce of wheat.	Maize.	Buckwheat.
	Bushels.		
In the state of New York, - - - -	12 per acre	25	15
Jersey, Pennsylvania, Delaware, Maryland, - -	8 ditto		15
Virginia (east of the Blue Ridge,) - - -	7	15	25 oats
Ditto (west of ditto,) - - - -	12	20	25

The average of the above, according to the number of districts, is nine bushels and three-quarters of wheat per acre; but as the first and last district, which are the most productive, are considerably less in extent than the two which are the least productive, the average of the whole, in proportion to the extent of surface, cannot be estimated at more than nine bushels per acre; to the other crops it is not necessary to pay attention. Now, that a country situated in the finest latitudes of the globe, with a soil certainly, by nature, as capable of producing, as the climate is of bringing to maturity, far greater crops, and certainly, in both respects, better calculated for grain than many parts of Europe, which produce from double to treble the quantity on an average, should yield crops which there, would be looked upon as scarce worth the collection, renders the cause of it deserving of our notice.

When inquiring into the subject, among the most intelligent people of the different states, I found this inferiority pretty generally attributed to a deficiency in the vegetative powers of the soil: it was said that a country, fresh out of the hands of nature, was not fertile; that it would bear a few tolerable crops when first cleared, but soon ceased to do it; and that it required the cultivation of ages, to render it as fruitful as old countries; so little were the best informed aware of their own defects, or the merits of the soil, or willing to acknowledge either of them. Some of the northern states, who remembered the days of greater fertility, attributed the visible decline to the depredations of the Hessian fly; but in Virginia, they scarcely know this insignificant animal, and therefore on it cannot cast the blame; and Virginia has probably experienced a greater failure of crops than any other state. In Virginia, this gradual decline has not injudiciously been ascribed to the culture of tobacco and maize; the first it has been observed, enriched the planter, but ruined the soil; the last ruined both; but the culture of tobacco and maize, as the staple articles of the country, has only been partial, being confined to some of the southern states, while the decline has pervaded the whole of them; therefore, however injurious these may have been, we must look deeper for the root of the mischief: that I venture to state, as likely to be found in *the present constitutions of the states, and the manners of the people.*

Before the revolution, I have reason to believe that the average produce of the soil would have stood considerably higher than at present, and there is no doubt that the owners of it were more opulent: at that time, the capital of the country was vested in the lands; and the landed proprietors held the first rank in the country for opulence and for information, and in general received, the best education which America, and not unfrequently Europe, could afford them; their estates were sufficiently extensive to make it worth their while to bestow their time and their money upon them; and the estates in return repaid with interest the attention and expense. The law of England* generally prevailed with respect to the descent of property; an aristocracy was formed of capitalists, well calculated for improving, cultivating, ornamenting, and enriching the country; great exertions and great improvements cannot be made in any country but by persons of this description; and no country requires such exertions and such improvements, as a *new one.* Since the revolution, a new order of things has taken place; new people, and people of very different occupations and pursuits, have taken the lead in the government, both of the confederation and respective states. The capital, as well as the government of the country, has slipped out of the hands of land owners; and these new people are now employed in very different, and, in the present state of things, more productive speculations than the cultivation of lands; in speculations frequently at variance with the best interests of the country. In some of the states, the gentlemen of landed property have passed into perfect oblivion; in none of the states do they bear the sway, or even possess their due share of influence, except perhaps in those of New England; and there, they only take it incidentally, as the lands are divided with much equality among every description of people, and are rather a secondary object, even with the principal people of the country, who generally, with a small occupancy of land, are obliged to follow other more lucrative pursuits, on which they place their chief dependence.

Before the revolution, real estates descended to the eldest son; the law, since that period, has ordained an equal division of them among *males and females* in equal degree, except in one or two states, where the eldest son takes two shares. This law has already had a very extensive, but a very mischievous influence; it has had the effect which the authors of it intended, in introducing a greater *equality among the people*; but it has had another also, which they might not have foreseen, and could not have intended; that of reducing them to *an equality of poverty, and their soil almost to a Caput mortuum.* Fewer people of landed property of any considerable opulence, are to be met with, than heretofore, and their numbers must be continually diminishing, from the influence of this law of descent; for though some people will not from custom acquiesce in it, and the wisest, from

* In the state of Connecticut real estates were always divided, as at present, among the children, male and female, the eldest son taking two shares; the evils, however, of minute division of real property, are there fully perceived and felt at this time.

a sense of the evils arising from it, which they already feel and lament; yet the law will occasionally have its course; and the estate once divided, can never again be united. The consequence of this is, that landed property is no longer an object of profit or pleasure; few choose to possess more than is necessary for their own convenience; fewer live in the country than heretofore; no houses, in many parts of the country, of any consideration, are building; and no improvements of any kind taking place. With the decline of this class of people, and their property, is also that of the produce of the soil; for the poor and the ignorant must unavoidably wear it out; the opulent and the intelligent alone can improve and ornament their country, and increase the produce of it. Such is the operation of the new constitutions on the higher orders; and it will be found, that manners too, have their full influence on the inferior orders; the mass of those we should call planters or farmers, are ignorant, uneducated, poor, and indolent: such an one who possesses an hundred acres of ground, will not in stock, furniture, or property, be worth £60; were he to possess such a capital, he would be esteemed a person of considerable substance; but he *boasts of his independence, and enjoys inaction.*

Of the people of this, and of inferior ranks, ease is the greatest bliss, and a frolic the greatest spur to activity; with such inclinations, labor will afford but a bare subsistence; and with this, such people will sit down contented rather than toil. From this picture, must be entirely excepted the people of the New England states; they, with a more rational love of independence, possess also an equal love of industry and order; consequently this exemplary and enterprising people, enjoy the natural attendants of such principles, knowledge, wealth, and power, in full proportion to their respective stations. The consequence of this state of things cannot be otherwise, than that the produce of the country must be stationary, if not on the decline; and that the supplies hereafter to be drawn from this, by other countries, cannot be greater, if so great, as they have been, unless some sudden and very material alteration of public principles and private practice should take place. It may account also, in part, for the excessive price which a demand not excessive, and no very great supply, has created in most articles of export from the United States, and especially within the last two or three years; and it may perhaps also appear, that this increased demand, and excessive price, have not materially added to the quantity exported* of articles

* The following is an account of the export of the staple articles of the United Sates, in the first and last years, in which it can at this time be obtained; in the first year, public disturbances in Europe had not had any material influence on commerce; in the last, a vigorous and general war had called for all the supplies that America could afford.

Year ending Sep. 30.	Maize. Bushels.	Tobacco. Hogsheads.	Cattle.	Horses.	Rice Tierces.	Flour. Barrels.	Wheat. Bushels.	Beef. Barrels.	Pork. Barrels.
1790	2,102,137	118,460	5,406	8,628	100,845	724,623	1,124,458	44,662	24,662
1794	1,472,700	72,958	3,495	1,828	*134,611	828,405	696,797	97,779	47,242
Loss,	629,437	32,402	1,911	6,800			427,661		
Gain,					33,766	93,782		53,117	12,780

* The return of this article being defective in 1794, that of 1793 is here taken.

The United States are therefore

Losers.	Dollars.	*Gainers.*	
By maize, at ½ dollar per bushel, -	314,718,5	By rice, at 18 dollars per tierce, -	607,788
By tobacco, at 40 dollars per hogshead,	1,416,080	By flour, at 6½ dollars per barrel, -	609,583
By cattle, at 20 dollars each, -	38,220	By beef, 6¼ dollars ditto, - -	331,981,25
By horses, at 40 dollars each, -	272,000	By pork at 8½ dollars ditto, - -	108,630
Buckwheat, at 1 dollar per bushel, -	427,661	Dollars	1,657,982,25
	2,468,779,5		
	1,657,982,25		
Dollars—	810,697,25		

The dollar 4s. 6d. sterling.

Therefore, though a bounty from 50 to 100 per cent, has been offered on the export of their chief articles of produce, in that great increase of price that was paid for them in 1794, yet in five years the United States have declined in the value of their export to the amount of upwards of eight hundred thousand dollars, according to the peace price. The price has augmented the export of articles of chief demand by the belligerent powers, but an immense loss in other articles, the produce of their soil, so as to leave the above great balance against the owners of it. If this be fairly stated, and the writer apprehends that the authorities from whence it is derived, cannot be disputed; surely it behoves the government of the United States to pay more attention to the landed and agricultural interests of their country; to remedy principles of law, so destructive to them, to occupy their minds on certain and immediate benefits, rather than attend to uncertain and distant speculations, before habits have become fixed in the mass of the people, which cannot afterwards, when wanted, be counteracted; before the principal people have abandoned a country life, as no longer affording them an occupation worthy of their attention; before their estates cease to be objects of rational pleasure, by being split into portions no longer worth possessing; and before they feel that their property and pursuits no longer afford them that influence, which their rank in society ought to give them.

of primary necessity to the countries demanding them, which they would have done, had the supply been naturally adequate, or capable of being forced.

"The husbandry of every country depending mostly on the market for cattle and sheep, and wool; how far is the bad culture of America owing to a want of them? Is there a demand for beef, mutton, and wool, in any quantities for exportation, or otherwise? And how far does the existence of these circumstances, in the vicinity of large towns, remedy such bad cultivation?

The answer to this has, in a great degree, been anticipated in the answer to the last question; what farther is requisite, will be found in detailing the prices of articles in the different parts of the country when I was there.

1794, September. New York city. Beef, 3¼ 3/16d. to 3¾ 1/16d.; mutton, 3¾ 1/16d.; veal, 5 4/16d. to 5½ 3/16d.; land, per quarter 2s.; pork, 5 4/16d.; pigs, live weight, 2¼d. per lb.; butter, 1s. 1½d. new milk 3¾ 3/16d. per quart; chickens, 10d. to 1s.; hay, £2 5s. to £2 16s. 3d. per ton; wheat, 5s. 7½d.; barley, 3s. 11¼d.; maize, 2s. 9¾d.; rye, 3s. 1½d.; oats, 1s. 8¼d.; per bushel.

New York State. Beef, 3 6/16d.; mutton, 2¾ 4/16d.; butter, 9d.; wheat 5s. 4 3/16d.; pair of good oxen, five or six years old, from £13 10s. to £14 12s. 6d.; three years old, £6 15s. per pair. Fat sheep which may weigh 14lbs. per quarter, 6s. 9d. each; wool of good staple 4lbs. per fleece, 1s. 5½d. per lb.

1794, October. Albany. Beef and mutton, 2¾ 4/16d.; butter, 8¼ 1/16d.; wheat, 5s. 9¾d.

1794, November. New England. Beef and mutton, 3½d.; butter, from 8¼d. to 10½d.; wheat 6s. 9d.; a drove of lean cattle going into Pennsylvania to be fed, some of which cost £18 a pair; and when fat would weigh 1500 lbs. or upwards, hide and tallow included.

About Chesterfield and Massachusetts, the best sheep in the United States, weigh as high as 20 lbs. per quarter, fleeces as 7 lbs. each, long wool but coarse, used for combing, sells for 2s. 3d. per lb. In Rhode Island, extremely fine wool fleece, from 1¾ lbs. to 2 lbs. sells for 1s. 1½d. per lb. unwashed; hay, £1 10s. per ton.

Boston. Beef and mutton, 4½d. per lb.; butter, 1s.; butter in barrels, from 8¼d. to 9¾d.; used to be 3d. and 3¾d.; geese, 2s. to 2s 3d.; turkies and fowls 4½d. per lb. ready for the spit. Cattle for the *curing-houses* in all parts of New England, in the drove, calculated at 18s. 9d. per hundred lb.; hide and tallow included. Beef from 31s. 6d. to 45s per barrel of two hundred pounds nett each, according to quality; the first is very bad, the last excellent; the demand is far greater than the supply, pork per barrel, not surpassed by any in the world, 72s. to 76s.

1794, December. New York City. Wheat, 7s. 10 1/3d.

Philadelphia. Beef 4¾ 1/3d. to 7 2/3d.; mutton and veal, 3½ 2/3d. to 5¼ 2/3.; best flour, 38s. 3d. per barrel, of 1 cwt. 3 quarters nett; wheat 8s. 4¾d.; best timothy hay, £3 12s. per ton; maize, 2s. 8¼ 3/3d. butter 9d. to 10¾ 1/3d.; milk, 4¾ 1/3d. per quart; bread of superfine inspected flour, 1 lb. 7 oz. for 3½ 2/3d.; of inspected common, 1lb. 8oz. for ditto; of inspected rye, 2 lbs. 3 oz. for ditto.

1795, January. Common meadow hay, £3 per ton; best timothy, £4 10s.

March. Wheat 9s.; flour, 47s. 3d. per barrel; fowls, 3s. to 4s. 6d.; ducks, 5s. 8¾d.; butter, from 10¼ 1/3d. to 1s. 1 1/3d.

Prices current at Trenton, the depot for Philadelphia; wheat, 9s.; rye, 4s. 9½ 2/3d.; maize, 3s.; oats, 1s. 9½ 2/3d.; buckwheat, 2s. 8¼ 3/3d.; ditto meal, 4s. 9½ 2/3d. per hundred lb.

May. Virginia, most part of the state. Beef, 2d.; mutton, 2½d.; wheat, (east of the Blue Ridge) 6s. 9d.; flour, 36s. per barrel; maize, 1s. 8¼d. per bushel; wheat (west of the Blue Ridge,) 4s. 1½d.; flour, 25s. 1½d. per barrel; rye, 3s. 4½d.; maize, 2s. 7½d. Richmond. Beef, 4½d.; mutton, 6d.; veal, 8¼d.; lamb, 5s. 3d. per quarter; wheat, 7s. 6d.; flour, 42s. 9d. per barrel.

June. Maryland, Baltimore. Beef, mutton, and veal, according to quality, from 5¼ 3/3d. to 7 4/3d.; butter, 1s. 2¼ 3/3d. to 1s. 4¾ 1/3d.; wheat, 9s.; flour, 49s. 6d. per barrel.

July. Philadelphia. Wheat 10s. 2¼ 3/3d.

New Jersey. Mutton and veal, 3½ 2/3d.; beef scarce at this season; butter, 11½d.

New York City. Beef and mutton, 6¾d. and 7¾ 8/16d.; veal somewhat cheaper; butter 11¼d. and 1s. 0¼ 8/16d.; wheat, 9s. 10d.

From the above detail of prices, it will not only be evident, that the demand for exportation must be greater than the supply; but that the consumption of the great towns, affords a price more than sufficient for all the articles that are carried to them. A very large proportion of the supply, both for exportation, and the consumption of the large towns, is brought from very great distances; cattle from the Chinessee country on lake Ontario, and from Kentucky, into the neighborhood of Philadelphia; the former not less than six hundred miles, the latter about seven or eight hundred. The chief part of the flour comes in barrels, from the heads of the rivers that fall into the Atlantic; and some by land carrige, from the neighborhood of Fort Pitt to Philadelphia, a distance of three hundred miles. That a supply in itself moderate, when compared with the vast extent of country, should be collected from such great distances, is sufficient proof that the large towns have not beneficial effect on, or power to remedy, the bad cultivation of the country, even in their own vicinity.

"It is said that all the better soils in the central states, when exhausted and left, cover themselves with white clover; ascertain the fact; and observe what soils they are, upon which this fact occurs most."

In every part of America, from New Hampshire to Carolina, from the sea to the mountains, the land, whether calcareous or argillaceous, whether wet or dry, whether worn out or retaining its original fertility, from the summit of the Allegany ridge to the sandy plains of Virginia, is spontaneously covered with white clover, growing frequently with a luxuriance and perfection that art can rarely equal in Europe. In the northern States, it affords an herbage throughout the year; in the southern, the seed ripens about July; after which time the heat of the sun scorches it up, and I believe it is no more seen till the spring following. The climate or soil, or both, seem particularly favorable to this genus of plants; the *trifolium repens*, *pratense*, *arvense*, *alpestre*, are abundant, and several others are to be met with. It is probably too late now to ascertain whether white clover be a native of this, as well as the old continent.

I am told it is never met with far back in the

woods, but immediately on their being cleared away, either by fire or otherwise, it takes possession of the ground; which should prove that it was natural to it; that the seed lies there, but cannot vegetate till the ground is cleared: but again I have been told, that by some tribes of Indians it is called white man's foot grass; from an idea, that wherever he has trodden, it grows; which should prove at least, that it had not been known in the country longer than the white man.

"Timothy produces immense crops in America: would it not be worth while to try some of the seed in England, and to sow it on the same kind of soil?"

Timothy grass* is extensively cultivated in the middle and northern states of the American Union, and I apprehend it to be the same as the *phleum pratense*, cat's-tail grass, of European botanists. I have frequently seen extraordinary crops of it, growing thick as it could stand on the ground, 3 or 4 feet in height, and in some instances coarse as wheat straw, however, in this state, as it is cut before maturity, and as in the climate of America hay is always well cured, however succulent at the time of cutting, horses prefer it to every other kind of hay, and thrive better upon it. I cannot therefore but think it worthy of some fair experiments in this country. No other grass approches it in produce; and it is particularly useful when mixed with red clover, in preventing it from falling too close to the ground.

"Clover seed from America ought to be tried, particularly on ground that is tired of English or Dutch clover seed: can such be procured?"

Clover, growing with such remarkable luxuriance as that in America, must produce good seed, and such may prove an useful change. Seed has frequently been sent from America to England; probably will be sent in future without any particular demand; and will hereafter be certainly sent, whenever ordered or required here. The price at New York in the autumn of 1794, was about 7d. per lb.

"Might not Great Britain be supplied with hemp from America?"

No supply of hemp can be drawn from the United States, since the quantity grown there is very inconsiderable, near the whole of their consumption being imported from the Baltic. No country seems better calculated for hemp than the states, as far south as the southern boundary of Virginia; beyond that, the climate is too hot for it; every where to the north of this, in every waste spot, hemp grows spontaneously, with a luxuriance I never met with elsewhere: I have seen single plants upwards of ten feet in height, with branches in every direction four or five feet in length, and with a stem more than four inches in circumference. I do not mention this kind of growth as an excellence in the hemp, because such branching would be injurious to it, but to show how congenial the climate and soil is to the plant: such excess of vegetation would be prevented in cultivation, by the closer growth of the plants.

Kalm, in his travels in America, remarks the luxuriant growth of wild hemp, particularly about the remains of Fort Saratoga, (by which I suppose he meant Fort Hardie, formerly built by the French at Saratoga;) at that very place, upwards of forty years* afterwards, I saw hemp at least eight feet in height growing wild, which probably had annually shaken its seed, and annually grown from that time to the present.

Notwithstanding this natural inclination in the soil to produce hemp, next to none is cultivated; this probably arises more from the indolence of the people, than any other cause. Hemp affords much labor in the winter, on which account it would be particularly valuable to an industrious people; but here, particularly the reverse. Winter is the season of frolic and dissipation, with which nothing must interfere. These habits do not appear likely soon to be eradicated, and till that change takes place, no hemp will be cultivated. American hemp is said to be peculiarly soft, silky, and pliable; and therefore better adapted than any other, for the running rigging of ships, and it is used for that purpose in most American vessels.

Hemp is said to be much improved in its brightness and silky quality, by being rated [rotted] in brackish water, which is always the case in America when possible: experiments of that nature, might in many instances be tried in this country.

While the United States were under the dominion of Great Britain, bounties were offered for the raising and exporting of hemp, but I believe with little effect; and are at this time continued by the state of Massachusetts, but with so little tendency to increase the culture, that the bounty for not more than one hundred tons, has been claimed in a year.

"Might not immense quantities of oil-cake for manure, and the feeding of cattle, be got from America?"

The only oil-cake† used for manure is the resi-

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* (1799.) I have cultivated the American Timothy grass, and English cat's-tail grass, in my garden for three years; and I find not the least difference between them, except that the timothy is about a fortnight earlier than the cat's-tail; the effect of the change of seed and climate. They are the *phleum pratense* of the variety g. *nodosum* of Withering. This variety, I find, is not well founded, as the bulbous root is acquired both in the timothy and cat's-tail, by luxuriant growth; and the bulbs or knots on the roots become larger and more numerous by age; young plants, and those stinted in their growth by a poor soil, have them not. The bulbous cat's-tail, is not common in meadows, at least in this part of England; but where found, is in patches in most rich ground, and is always productive of an heavier crop than any other part of the field: and I do not find but that cattle eat that part, as close as any other. This grass appears to thrive in the garden; but should it grow when cultivated in the field with American luxuriance, I should doubt of an English sun being able to cure the hay to American perfection.

* Not having Kalm's Travels by me to refer to, I do not know the precise date.

† (1799.) In consequence of the above recommendation, the importation of oil-cake was allowed by 36 G. III. chap. cxiii. entitled, "An Act for allowing the importation of arrow root, from the British plantations, and also of linseed cakes and rape cakes, from any foreign country, British built ships, owned, navigated, and registered according to law, without payment of duty." But this act has had no effect as far as relates to the importation of linseed cakes and rape cakes from America; probably from a mistake in the wording of the act, which confines the importation to British ships alone. To import arrow root, the produce of the British plantations, it is requisite, according to the navigation laws, that it should be imported in British built

duum of rape seed, after the oil has been expressed; but as rape is a plant unknown in any part of America, though without doubt it might be cultivated there to great advantage, no oil-cake for manure can be procured from thence.

Much linseed oil is used in the United States, where the houses, mostly built of wood, are painted on the outside.

A great quantity therefore of what is called linseed cake, or oil-cake, being the remainder of the linseed after the oil is pressed out, might be purchased there; and would be highly useful in England, in fattening of cattle, and for other purposes: it is chiefly consumed there by milk-cows, in the neighborhood of the great towns, and sometimes in fattening cattle and hogs. The present price of it in America is 40s. per ton; while the price of the cake here is not less at this time than £8 8s.

A gentleman in this country, aware of the advantage of importing this article from America, was lately desirous of accomplishing it; but on making the necessary enquiries, found that those cakes came under the description of one of the *non enumerated articles*, and consequently were liable to a duty, (I believe £27 10s. per cent. on their value,) which amounted to an absolute prohibition. This prohibition seems in good policy proper to be taken off; and I cannot do less than recommend the subject to the consideration of the board.

"Irrigation is much practised; the method, soils, effect, and every other circumstance, should be attended to."

Irrigation, as far as I could learn, is known only in two parts of the United States, and in neither of them practised to any considerable extent. It offers no material circumstances worthy of imitation, nor is it conducted on any principles, that are not at this time much better understood in this country. Connecticut is the most northern state where it is met with: the practice was probably carried thither by the first settlers, most of whom emigrated from those counties in the west of England, where it is now best understood; but they do not appear to have kept pace in improvement with their kindred on this side of the Atlantic.

The German tract in Pennsylvania, is the other part where it is practised, and the knowledge was carried thither from Flanders or Germany. Two crops of hay are always cut where lands are thus artificially watered.

The law has ordained the right of the water to be in him who possesses the spring head, or the highest part of the stream; he may consume what quantity he pleases, but must convey the remainder into the ancient channel; he must not divert the stream, or waste the water to the prejudice of those below him. The mode of applying the water is different in the two states: in Connecticut it is turned on the land as soon as the weather begins to be warm in the spring; but it is not allowed to flow for more than twenty-four hours at a time: it is then taken off for a few days, then turned on again for twenty-four hours, and so on, till the meadow is nearly fit for cutting; immediately after which, it is applied again in like manner for a second crop, and then again to force the aftergrass in autumn but it is always found to have the greatest effect upon the spring crop.

In this state they also apply water to their lands, in another very different and unusual manner; they flood great tracts of low meadows, situated on running waters, just before the winter sets in, to the depth of two or three feet, by stopping the course of the stream, and let them thus remain covered till the spring, in order to keep them warm, and defend them from the frosts. These lands produce the following year a considerable quantity of coarse hay; which, in consequence of the fine climate in summer being very well got, is eagerly consumed by the cattle in winter; after the hay is cut, these fields for the remainder of the year are pastured.

In Pennsylvania the water is usually turned on the meadows about the middle of April, and is allowed to flow about two months; a few days after which, the ground having got dry, the crop is cut: as soon as the crop is off, the water is again turned on for three or four weeks, or till the land gets a sufficient covering to defend itself from the sun, at that season very powerful; a second crop is then soon ready for the scythe; after which the water is allowed again to flow over it, till within a short time before it is wanted for pasturage, when it is turned off, in order that the ground may so harden as not to receive injury from the treading of cattle. Which of the two methods of applying the water may be most productive, I know not, not having seen the meadows of Connecticut in the summer season; but those of Pennsylvania bear abundant crops.

Water issuing from limestone in Pennsylvania, is thought preferable to any other running stream; but the warm half putrid water from the reservoir made for this purpose, which is not unfrequent, or a mill dam, in which it becomes soft, slimy, and muddy, is greatly preferred to all others; water of this kind, at this season of the year, will in Pennsylvania be heated as high as 85° by Farenheit's thermometer, and must have a great effect in forcing vegetation

No art is used in conveying the water beyond a channel, carried on a level as far as it can be done conveniently, over one side of which it can flow: no means have been taken for raising it above its natural level, which in many places might be performed with much facility.

Since the introduction of clover, these meadows are falling fast into disuse, many of them having been already ploughed up and converted into tillage; no farther improvements are therefore hereafter to be looked for in this branch of rural economy.

"To examine how far, to what cause owing, and the effects of an indigent poor in the United States, is an object of great political importance, and whether such are ready to emigrate to, or beyond the mountains?"

There are no indigent poor in the United States. In a country, where in every part the demand for labor greatly exceeds the supply, where wages are high, and provisions not in proportion to them, no

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ships; but the oil-cakes, being the produce of foreign countries, ought agreeable to the same navigation laws, to be allowed to be imported in the vessels of the country that produces them, as well as in British vessels; as all other importable articles, the produce of such countries, are allowed to be imported: no doubt the words, British built ships, where they refer to linseed cakes, and rape cakes, have been inadvertently inserted. I must therefore again recommend this article to the consideration of the board, as the importation of linseed and rape cakes, appears an object well worth their consideration.

one can want, that will labor; and the able, who refuse to work, will there meet with no support. In the country, I never heard of poor; in the great towns, there is a reception for such as want it; in which are a few people, chiefly negroes and foreigners, whom the accidents to which the lower classes are liable in a town, or the diseases of a new climate, compel here to seek a refuge. These poorhouses are either maintained by a tax on the inhabitants, or more generally by the corporation of the town, or by the state.

None emigrate to the frontiers beyond the mountains, except culprits, or savage back-wood's men, chiefly of Irish descent. This line of frontier-men, a race possessing all the vices of civilized and savage life, without the virtues of either; affording the singular spectacle of a race, seeking, and voluntarily sinking into barbarism, out of a state of civilized life; the outcasts of the world, and the disgrace of it; are to be met with, on the western frontiers from Pennsylvania, inclusive to the farthest south.

GREAT DEPTH OF THE BED OF MARL LYING UNDER NORFOLK.

Having recently learned in a conversation with an intelligent gentleman of Norfolk, Va. that the boring for water in that town had passed through a bed of marl for more than 70 feet, without reaching its bottom, we were anxious to ascertain the strength of the body: and requested to be furnished with specimens (which had been preserved) from the upper, middle, and lowest part. These have been received, enclosed in the following letter, which, though private, we will make free to publish, as it states what is desirable to know, both clearly and concisely. The three specimens were so small that no larger trials could be made than are stated below—and nothing was sought but the carbonate of lime, which is contained in very small and yet very regular proportions, for such great difference of depths. The earth when mixed with diluted muriatic acid, is of an unusually vivid green color—and probably contains more *green sand*, than of carbonate of lime. This however is merely loose supposition. The depth at which this great bed of marl lies, and its small amount of calcareous matter, render the facts of less importance to agricultural, than they may be to geological investigators.

The carbonate of lime found was as follows.

At 70 feet deep—20 grs. contained	2	of carb. of lime.
102	34	3½
140	27	3

Or proportions varying between 10 and 11 per cent.

Norfolk, July 18th, 1835.

Dear Sir—It affords me much pleasure to be able to comply with my promise, as regards the marl found in boring for water in this place.

I have seen one of the gentlemen who conducted the operation, and have obtained from him some information as to the different strata through which the auger passed, which I submit.

"For 14 feet below the surface, fine sand.
— 16 feet more, marsh mud and shells, chiefly clam and oyster.
— 10 feet more, unable to judge—the pipe being filled by upper mud.
12 feet more, fine quick sand, unmixed.
12 to 16 feet more, a different stratum of gravel, in size from less than an eighth, to three-quarters of an inch, the longest diameter—varying in color, but chiefly clear white, much resembling crystal.
Thence to the depth when the auger broke, say 70 or 80 feet, green marl."

This information is not given from notes, and is not exact as to distances, making the depth 138 to 148—the true depth reached being 143 feet.

I have received 12 samples of the following depths: 43 feet—47—49—57—62. These five are all of sand and shells, or pure sand. The others are 70 feet—82—92—102—108—128—140. These are all of marl, of nearly the same uniform appearance as to color, and of the consistence of putty. The only perceptible difference was that the upper part of the bed seemed to have more undecomposed shell in it, although shells were found at every depth.

I enclose small quantities of the marl at 70—102—and 140 feet. Should you wish others I can supply you with them at any time.

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THE THREE-SHIFT SYSTEM.—ON SPAYING HEIFERS.

To the Editor of the Farmers' Register.

White Marsh, Gloucester, July 10, 1835.

If I had leisure and the ability to convey my thoughts clearly and forcibly, I should certainly make some remarks for publication (and you are at liberty to use these if you think proper, and will take the trouble to correct and improve, holding me responsible for the facts*—) upon Mr. John A. Selden's communication in the first No. of the third volume of the Register; because it is calculated, I think, from the high standing and character of the author, as a gentleman and agriculturist, to mislead most farmers of the salt water region. His system may answer very well at Westover, and upon the fine wheat and clover lands on James River, after leaving the salt water, but as far as my observation extends, I do not think it will answer below. I have uniformly observed that the most successful farmers with us, those who live best, and accumulate most, (and I go for results altogether,) have been large Indian corn makers. That is a very certain crop on tide-water, whereas wheat is a very uncertain, at any rate a very unproductive one. On the White Marsh estate, producing from seventeen to eighteen hundred barrels of corn annually, it has not varied five per cent. for the last four years. There has been some improvement in the cultivation, which has enabled me to reserve a part of the former corn land for fallow and improvement, during summer, and still make about the same quantity of corn, as communicated to you in the early part of your useful publication.

I suppose Mr. Selden has stated the average corn crop made, and not what was sold, (I entertain the opinion of an old friend who considered

*We take this liberty whenever it is deemed necessary, as to matters of mere form. In this case it is in no respect called for. Ed.

the bill of lading as the best evidence of what was *made*,) by which it appears, the corn made on his estate would produce little more than one-third of the wheat made, whereas my corn crop would sell for about double the wheat and barley, (taking his price for corn and wheat, and the real price at which the barley was sold.) This year the disproportion would be much greater in favor of the corn, which clearly shows the difference in our situations, and the propriety of yielding to circumstances.

Mr. Selden informs us that he keeps twelve mules, and makes an average crop of four hundred and thirty-five barrels of corn. My regular plough team consists of six mules and six horses: two extra horses are kept, and another plough used at busy seasons. The average crop for the last four years, as before stated, is from seventeen to eighteen hundred barrels of corn. Mr. Selden complains that none of the advocates of the three-shift system will descend to particulars, and I consider myself decidedly one of them with a little variation, in having standing pastures and reserving a part of each shift in succession for fallow and improvement during summer. My three divisions consist each of about three hundred acres of low grounds, and a high land lot of about twenty-five acres, of which a part is for fallow, and that being in the corn fields is not grazed at all. From two hundred and seventy-five to eighty acres being in corn, the average product of course is a little above six barrels per acre. One of Mr. Selden's objections to the corn crop, "that it will not answer as a sale crop for persons living at a distance from navigation," is a strong recommendation to us upon the sea board. My small grain crop (that is, wheat and barley,) has averaged for the last four years about three thousand five hundred bushels per annum. The latter crop has been very unproductive for some years past, and on that account has been generally abandoned. About two hundred acres of corn land, and about sixty-five acres of fallow, are seeded in barley and wheat, the average of course about thirteen bushels per acre. I seed sixty to seventy acres of the corn land in oats, but not for sale, or very few. They are fed in a chopped state throughout the year, to every thing of the horse kind, mixed with a little meal. I have no doubt that much of the level tide-water country should be cultivated in two shifts, one year in corn, and the next in oats. A very improving bean under that system succeeds the oats, which is not the case under any other.

The most objectionable part of Mr. Selden's communication, in my estimation, is the reflection cast upon that valuable animal the ox, without whose services I would abandon agricultural pursuits. I am as devotedly attached to that species as we generally are in Virginia to that of the horse. The labor performed by oxen, when well taken care of, is incalculable; and the patience with which it is borne, always excites much feeling with me in their behalf. Nothing is consumed by them that can readily be sold from the estate. I would not permit half the quantity of corn necessary to keep them in good order to be given to mine, if it was furnished gratis; and never feed with it. A small quantity only serves to destroy their relish for coarse strong food. I would as soon think of feeding laborers on mince pies, and expect them to be satisfied afterwards with pork and bacon.

For Mr. Selden's favorite fallow system, the ox is admirably calculated. Four good oxen with one of Davis's large bar-share ploughs will execute more, and better work than any team of mules I have ever seen. When broken to, and kept exclusively for the plough, they walk nearly as fast as mules, and by working half the day and changing, lose no time to feed, and will keep in good order on the very land they are fallowing: for it either has, or ought to have, to justify the fallow, a good cover upon it. I am not a very nice calculator upon this or any other subject, but when we consider the first cost of a good mule, or work horse, the annual expense to keep him properly, the difference in gear, the interest upon the cost, and that the capital itself is lost upon an average in ten or twelve years, and then contrast him with the ox, we must decide in favor of the latter.

The mule is recommended by Mr. Selden on account of his longevity: but the ox may be said to live forever. If taken care of, an old ox will more than purchase a young one. I keep employed the greater part of the year, upon an average, thirty oxen (including spayed heifers, which my people prefer to the ox, as more active, and of better wind, and they are greatly preferable for the table.) They cost me nothing, and return to the land at least as much as they take from it.

It is so important to separate the young from the old cattle (until they are three years old at least,) without which you cannot get the females at any rate of good size, that I keep three standing pastures, one extending to the river for the purpose of salting all the stock occasionally. Another consists of an extensive wood with a small portion of open land, and is useful in winter and spring, particularly for sheep, which are very injurious to pasture early in the spring. I never graze the cultivated land until late in June—(August would be much better—) when it is well covered, and the stock can make very little impression upon it.

I am sure the annual profit by sale, derived from my stock, in addition to the supply of my family, would more than pay every expense of the estate, and almost entirely from Mr. Selden's despised race, (the sale of oxen, milch cows and butter,) for I give to my people in addition to a moderate quantity of beef and mutton, all the pork we can raise over and above the consumption of the family. I made the arrangement as an inducement to take care of and increase the quantity, and find it succeeds very well. The hams which we do not use, (more than half) are sold at a high price, and the proceeds invested in midlings, which are preferred. All the wool, with enough cotton both for the summer and winter clothing of the slaves, is manufactured on the estate, so that if we do not sell much, we purchase little.

JOHN TABB.

P. S. Since writing the above, the No. of the Register for July, has been sent me from Norfolk, in which I observe a communication on the subject of spayed cows. I have often thought it strange the practice of spaying was not more common. About sixteen years ago, my father, Philip Tabb of this county, who was in the habit of

spaying two or three heifers every year for beef, at the proper age, had the experiment made on a cow with her first calf, which succeeded; and he sent her to me at Norfolk, after keeping her a year or two, thinking she would be desirable for a town cow. She gave as much milk as ordinary cows, and I thought at first she would be a great acquisition, but soon found one inconvenience attending her which had not occurred to me. Having no calf to attach and accustom her to my lot, it was necessary to send after her whenever required, or keep her up altogether, which was inconvenient, and being (as most spayed animals generally are) in fine order, I lost her in a few months, and have no doubt she was sold to the butcher. I have always regretted the loss, not so much on account of the value, but that I might have ascertained how long, and in what quantity she would have continued to give milk. I have now on this estate eighteen spayed heifers, (and I kill two or three every year for beef,) from one to seven years old. The operation is performed when they are about a year old, say in the month of May, and with the single precaution of keeping them entirely from food or water for twenty-four to thirty-six hours before—is not attended with the least risk—is performed in the same way, and may be done by any person in the habit of spaying hogs. They go to their food immediately after, and require no attention. The operation has been imperfectly performed two or three times, and they had calves afterwards: but I have only lost one, and that in consequence of keeping it suspended a very long time, in order to teach, and indeed, to permit an inexperienced hand to operate. We select the most indifferent calves to spay, which is one way to improve the stock. You increase the size amazingly. They become as large as ordinary oxen—are easily kept—make the finest beef—and as they are not in perfection till six or seven years old, we work them after three or four, to make them gentle, and consider them superior for that purpose, to the ox.

I have had so little experience in farming, and am necessarily so much absent in the performance of other duties, that I am loath to make any communication for publication, and certainly should not, but for my knowledge of the liberal and charitable feeling amongst farmers toward each other. One of the greatest objections to landed estates in Virginia, consists in the difficulty of procuring first rate managers. The difference between good and bad management is, abundance and wealth in the one case, and want and poverty in the other. I have been very fortunate in that respect; and acknowledge myself under obligations to Mr. Anthony Smith, my manager. For industry, humanity, care and attention to the people and stock, he cannot be surpassed; and I take the liberty to suggest to every farmer who has a good manager, the propriety of selecting one or two boys of intelligence and good character, to place under him. Patriotism and self-interest should prompt them to do so, as the best mode of increasing the number of good managers, and their chance of obtaining one, and of improving the country. It is impossible for the proprietor of a large estate to attend to the details; and perfectly useless for him to read, think, and plan, unless he can procure an agent who can understand and execute.

J. T.

For the Farmers' Register.

REMARKABLE FECUNDITY OF A EWE.

Mr. William Nottingham, sen. has at his farm near Eastville, (Northampton, Va.) a ewe which has brought 20 lambs in 7 years and 2 months, from the first to the last yeaning; and omitting the last, the first 19 lambs were produced in less than 6 years. The following dates and numbers were copied from the written memoranda kept by Mr. Nottingham, on whom, as a man of observation and accuracy, the most entire reliance may be placed.

The ewe was yeaned in February 1827.

In February 1828, she brought	2 lambs.
February 1829,	4
November 1st, 1829, (being 7 in 19 months.)	3
February 7th, 1831,	3
March 10th, 1832,	3
January 18th, 1833,	2
December 31st, 1833,	2
April 13th, 1835,	1

None of these were supposed to be premature births, and as large a proportion of the lambs lived as could have been expected in ordinary flocks, from births as they usually occur. Great care was generally taken of the mother, but owing to particular occurrences, she was sometimes greatly exposed. Her four lambs were yeaned at a birth, when out in a severe snow storm, and all (I believe) died in consequence. The ewe was raised as a house lamb, and is of the common breed. She was the only ewe kept on this farm, and has been always fed abundantly. When giving milk, her udder was stated to be more like a cow's in size, than that of a sheep. But if her fecundity was caused altogether by high feeding, it would seem that the same effects may be continued in her race by like treatment. Some of the female lambs of this ewe were given to Mr. Nottingham's sons, and have been kept as breeders, with the like abundant supply of food. Of these, "one has had 4 lambs at one time, and 3 at another time—another had 4 lambs at her first and only yeaning—and a third has had 3 lambs at one yeaning." These latter facts were also furnished me in writing by Mr. Nottingham's son. I omitted asking what proportion of these were raised—and did not note down the proportion of those lost by the old ewe.

Mr. Nottingham's flock of sheep is kept on grazing land on the sea side, and the mother of this family has been the only ewe kept at his house. In addition to this peculiar situation, she had the company every year except the last, of more than one male—as several ram lambs were brought home from the sea-side pasture at shearing time, to be killed in the course of the year. Upon these facts, and his observations, Mr. N. has formed the opinion that the several lambs of each yeaning, had different sires—and that the number of males in fact determined the number of lambs. Whether this strange opinion is well founded or not, Mr. N. is so sure of it, that he has latterly more than once before the yeaning stated correctly the number of lambs that would be produced. The last time there was only one male with her.

E. R.

July 13th, 1835.

"A DEED WITHOUT A NAME."

To the Editor of the Farmers' Register.

Having derived much useful information from your valuable periodical, the Farmers' Register, I have thought it the duty of the whole fraternity of agriculturists to contribute each his portion of information for the benefit of the rest. Indeed, my mite would have been thrown into the general coffer before this, but for my thorough aversion to placing my proper name to any paper which possibly might get me into difficulty, or which might involve any sort of responsibility. Shall I tell you the reason? A *friend* of mine gave me a mortal aversion to its vain glorious use. Some sixteen years ago I visited Richmond, and was invited by a gentleman of that city to partake of his good cheer, and being somewhat fond of the good things of this life, I indulged as far as a reasonable man may be supposed to have done. At the winding up of the feast, my friend invited me to unite with him in a note for $10,000 at one of the banks, which he would at a proper time redeem. The request was reasonable enough—the name a mere matter of form. Besides, it was quite a creditable thing to be the endorser—aye the endorser, of such a good fellow, and one who spoke of thousands as I now do of dollars. Well! sixteen years have passed away—my friend is a bankrupt—his property made over to a favored few: and if you have any curiosity to know who the author of this paper is, on the first discount day in August, a small man, of a sorrowful countenance, wearing a broad brimmed straw hat, and riding a gray mare, may be seen on the turnpike, wending his solitary way to Richmond to renew this very note. True, it has been clipped a little, but the sum of $6450 still remains due. Can mortal man wonder at my aversion, therefore, to write my name in full on any paper? Such is my abhorrence, Mr. Editor, to any unnecessary display of the sort, that in addressing my own dear children I subscribe myself generally, simply "your father." I know them to be wise, and rely on their knowledge of the old man.

With these preliminary remarks, I shall proceed to give in my experience as a tiller of the earth. *I have marled*, Mr. Editor, God be praised, I have marled. Not to the extent of thousands, but a cool hundred or two. Now mark me. In one of my best fields, I had a gall, a washed knoll, precisely such a spot as every judicious farmer most sedulously avoids when showing his crop to his neighbors. Now, sir, one of my first operations with the precious mineral, was to apply it to this knoll, or gall. And what suppose you is the consequence? Why, sir, when a neighbor comes to see me, and a walk is proposed, I generally manage to take him by a sort of circumbendibus, around to this poor despised gall, where on this 13th of July, the corn is actually tasseling, and probably will produce six or eight barrels per acre. I could not have believed it on the testimony of others.* Mortal man would scarcely believe it. And now my good sir, when my spirits are depressed, I generally take a walk to look at the corn on the marled land. When the cashier informs me that on such a day my note falls due, I walk to the marled land. If any thing crosses me there I go, morning, noon, or night. Upon my word I begin to think marl will cure half the ills of life. My wife says it has prevented the chickens having the gapes. She declares that never had she so little trouble with the young turkeys: and in fact she verily believes the health of the children is greatly improved. All this, my dear sir, she attributes to the marl. And now, sir, I am straining every nerve to fertilize every arable acre of my farm, by its immediate application. An ox cart is generally devoted to this business: and I regret that my means will not enable me apply double the force to this beneficial purpose.

I entreat you not to regard this as an exaggerated statement. I am incapable of an untruth, or any manner of deception.

SUBSCRIBER.

**Neither can we*—and it is presumed that our correspondent will permit others in this respect to assume what is precisely his own ground. Farther—*we would not believe our own eyes* in such a case—and if more respect could be paid to the eyes of another, it would not be to a correspondent without a name. Of course our amount of faith as to such effects of pure marl alone, is (like our correspondent's interest in the bank,) a quantity largely *minus*.

But though holding as nought the only agricultural fact of our unknown correspondent—and supposing that his object is to make light of those whom he may deem marl-mad farmers—his communication is freely given a place; and if for no other reason, as evidence that we are willing to bear our full share of good humored reproof, whether deserved or not. In this it is hoped that a profitable example is offered to some of our "thin-skinned" friends. Whenever our new correspondent will give his true name, or authenticated facts, he will be received with hearty welcome—(and the more so if his hand writing should be more legible—) for however well he handles his present subject, it is not altogether suited to this journal, and would not have been admitted, but for its apparent personal bearing.—Ed. Farm. Reg.

For the Farmers' Register.

ANALYSES OF SOILS [FROM ALABAMA] MADE BY DR. R. W. GIBBES. JULY, 1835.

Colberton Plantation of Col. F. Elmore.

1. *Black or Slue Prairie*—(from Big Slue—) 6 to 8 inches below the surface.
Vegetable matter 26 per cent.
Carbonate of lime 32 "
Silex, alumina, oxide of iron [the remainder.]

2. *Hammock Prairie*—(between House and Cedar Ridge.)
Vegetable matter 36 per cent.
Carbonate of lime 22 "
Silex, &c. &c.

3. *Open Prairie*—mahogany colored—(between Gin House and William Colbert's field.)
Vegetable matter 38 per cent.
No limestone.
Silex, &c. &c.

4. *Hog Bed Prairie*—(William Colbert's land.)
Vegetable matter 26 per cent.
Carbonate of lime 8 "
Silex, &c. &c.

5. *Post Oak Prairie*—(near Goodson's.)
Vegetable matter 38 per cent.
No limestone.
Silex, &c.

6. *Moulton Plantation of Dr. J. H. Taylor.*
Black Slue Prairie—(Woodland's—best.)
Vegetable matter 28 per cent.
Carbonate of lime 12 "
Silex, &c.

7. *Prairie*—(scattering last post oak) mingled with red clay.
Vegetable matter 32 per cent.
Carbonate of lime 6 "
Silex, &c.

8. *Open Prairie*—from a hill or ridge.
Vegetable matter 32 per cent.
Carbonate of lime 18 "
Silex, &c.

Chisholms.

White Open Prairie—from near surface: soil not more than 18 inches.
Vegetable matter 28 per cent.
Carbonate of lime 42 "
Silex, &c.

All the specimens except the last, taken from about 6 or 8 inches below the surface.

SOME ACCOUNT OF THE PRAIRIE SOILS OF ARKANSA.

To the Editor of the Farmers' Register.

Hempstead Ark. Ter.
June 27, 1835.

The May No. of your valueble journal being received, my attention was attracted by "Statements of the constituent parts of soils of the prairies of Alabama," and more particularly fixed by the editorial remarks soliciting information on the subject of prairies in general.

In anticipation of Mr. Featherstonhaugh's forthcoming report of his geological survey of Arkansa, (though I much fear from the rapid manner of his travelling among us, his investigations have been neither accurate nor minute,) I will endeavor to give you such an account of those in my vicinity as a sixteen years' residence among them, without any pretensions to science, enables me to do.

The prairies of Arkansa exhibit every variety of soil, surface, exposure, and degree of productiveness, when under the hand of culture. Those that border the Red River are nearly a perfect level, formed of alluvion, composed of a dark red clay and sand, a little elevated above the surrounding timbered land. They contain no remains of shells, but the soil resembles in all respects, that of the timbered alluvion adjoining.

Another description of prairies occupies elevated situations, the surface composed of a mixture of rounded smooth pebbles, oyster shells and their fragments, a pale yellow clay, and a little sand. They are broken into ridges and valleys, and rounded knobs surmounted with post oak timber.

The Mound Prairie, and those that extend for some miles around it, are found of gently swelling ridges, divided by timbered valleys. They exhibit considerable variety of soil. On some the surface is mixed with sand; others are nearly or quite destitute of it: some are a deep black; others a light gray; others again are of a yellowish brown; and the whole of them rest on a foundation at various depths from the surface, from one to six feet, of a pale blue rock, that is soft enough to cut with a knife, but hard enough for hearth stones if kept out of the weather, but which slacks and crumbles into powder on exposure. I have seen corn and cotton of the rankest growth, standing in an unmixed bed of this substance that had been thrown up from the bottom of a deep well. This rock lies in strata of from four to eight inches thick, in alternate layers of harder and softer matter, and of a darker and lighter color. The lighter colored masses have been burned into a superior quality of lime, and the deeper into good potter's ware. Oyster shells and pieces of coral are every where found upon the surface, and imbedded in the rock; as well as petrified bones, and a very heavy black substance that resembles blacksmith's cinder, and entirely volatilizes by heat, with a strong sulphureous smell.* This sulphur ore, as it is called, when exposed to the air under shelter, incrusts itself with crystals of copperas. Masses of crystalized gypsum are also sometimes found deposited in chasms of the rock penetrated in digging wells. This rock, varying but little in appearance, underlays the whole of this section of country, timbered land as well as prairie. Large trees torn up by storms, many times contain, entangled among their roots, oyster shells and their fragments, rounded smooth pebbles, red clay and sand. When the timbered lands join upon the prairie, the roots of the timber are imbedded in a stiff red clay, and elevated generally about a foot above the edge of the naked prairie, exhibiting the appearance of this superstratum having been washed away from the space occupied by the prairie. The roots of the timber however, strike some depth below the red clay, into the shelly substance beneath.

These prairies when I first saw them in 1819, were clothed with a tall fine grass, and ornamented with flowers, without any mixture of timber or shrubbery, except at long intervals, where a clump of veteran post oaks had been able to resist the annual fires. Now, a large proportion of the prairie is in cultivation; and what is left out as commons is nearly divested of its native grass, by numerous herds of domestic animals. The fire has ceased to sweep over them, and thickets of crab, thorn, persimmon, mulberry, elm, honey-locust, peccan, the different oaks, the vine rose, grape vines, rattan, green brier, and blackberry bushes, render them in most places impassable. In the oldest thickets, the more vigorous trees are already destroying those of weaker growth, which die, fall, and the fire thus furnished with nutriment, begins to thin out the underbrush, and give this recent growth the appearance of young open woods. Thus, as soon as the native grass is so much eaten out as to prevent the fire from running over the prairie, these sprouts spring up-pierce with their roots the shelly substance beneath, loosen and dissolve its texture, elevate its

*This is sulphuret of iron—also found in the Alabama prairie soils. See Essay on Cal. Man., 2d ed. p. 22.

surface, change its color, and form and accumulate a rich vegetable mould. The new lands lately cleared of these thickets, and put into cultivation, are much richer and more productive than the naked prairies formerly were, that were put in cultivation before the thickets had grown; and the prairie fields that have been many years in uninterrupted cultivation, in corn, cotton, wheat and oats, and so managed, by ploughing in all the vegetable rubbish every year, as to prevent the soil from washing, are continually improving. I know of one field of fifty acres that was at first a naked gray prairie, that has been constantly cultivated in cotton for the last ten years, that produced last year a bale of cotton to the acre. The rust in cotton has never been seen in the country. The soil of this field has become black. The black timbered land of the valleys, however, the soil of which is composed of the wash from the prairie hills, mixed with the decayed vegetation of the low grounds, is that which is the most valuable. The oldest fields show no symptom of decay, nor are they much influenced by excessive rain or drought. They have been proved to be equal to any soil in the world, in any climate, for corn, cotton and wheat. The vast extent of new wild land that remains yet to be put into cultivation, has as yet prevented us from paying any attention to improving the quality of our soils, for indeed, they are so rich by nature as to seem not to require it. The crops of last year were fully equal to any ever before produced; and those on the oldest fields were the best. For this reason, the crops of wheat, though few, and on a small scale, might vie with those of the middle states in the best seasons. We have now, at this time, had no rain to moisten even the surface of the ground since the 30th of April last, yet our corn and cotton on the low grounds are not in the least injured.

Thus have I given you a statement of facts respecting the southern portion of Arkansa, as they have come within my personal knowledge. I regret much my inability to give you a chemical analysis of the different soils, and still more the want of a proper conveyance for specimens. I want to send you, or the editor of the Farmer and Gardener, larger quantities than are proper for the mail, and I would with pleasure remit a box during next season, to any gentleman in New Orleans, whom you will name to me for the purpose.

From the sensible properties of our best prairie soil, without using chemical tests, I judge it to contain a large proportion of carbonate and sulphate of lime; a due proportion of alumine, and a small proportion of silex and iron. A strong smell of sulphur is also sometimes perceived from fresh ploughed ground in a hot day, and lumps of carbonate of magnesia I have found imbedded in a red clay.

Intelligent strangers that come among us, gaze at every thing they see with wonder and delight. They find many things new and unheard of, in the appearance and sensible properties of the soil, the vegetable productions, and the indications of minerals. They are captivated with the transparency of our atmosphere, and the rosy glow of smiling health that animates the countenances of the inhabitants.

N. D. SMITH.

ON THE ADVANTAGES TO BE DERIVED FROM THE ESTABLISHMENT OF AN AGRICULTURAL PROFESSORSHIP.

To the Editor of the Farmers' Register.

Barboursville, July 23, 1835.

SIR:

It has been a settled conviction on my mind for years, that a professorship of agriculture—a pattern farm, and such a paper as yours, united therewith, would be productive of incalculable benefit to the commonwealth. The space of a letter is too confined to admit of one-half being stated. Suffice it to say, it would elevate the science—add dignity to the pursuit—call off from encumbered vocations a portion of the mind of our citizens now lost to the community—present a rallying point for all the scattered information of the land—reduce to the test of experiment every theory plausible enough to justify it—by the same standard to prove the value of every discovery or improvement—promote economy by causing one experiment for many—a certain and rapid communication, through the state, of the results—furnish a sure means of ascertaining the nature of our climate—the quantity of rain falling in the year—the seasons when drought most generally prevails—and by consequence, furnish data to guide the husbandman in the cultivation of crops, both as to time and kind. But I must stop—for I find no end to the advantages that would result from such an establishment. Let me, however, add one more. All these things are to be done before the youth of Virginia—the future men of the commonwealth, destined eventually to influence her destiny. A portion of these, selected from every part of the state (say one to each congressional or senatorial district,) of promise, but unable, from poverty, to educate themselves, to become the adopted children of the state, would be able by alternate labor and study, alike to keep up the farm, and to improve themselves. Indeed, it is worthy of the profoundest consideration, whether every student of the University would not profit by a few hours' work daily, in the proper season. These being my views, I submit to you whether it does not behoove the tillers of the earth to make an effort to induce the legislature to attend to their neglected interests. How is this to be done? I answer, as every other sect effects every thing by conventions—to that alternative we must also resort. What say you to such a convention, to meet in Richmond the first Monday in January? Let any one who feels an interest in the object attend. Let each agricultural society in the state be represented there. If it be asked what good can come of it, the answer is, let us try it. A free communion of the intelligence of the land cannot be altogether unproductive of good fruit. Apart from what can be done by such a convention on its own means, an appeal may be made to the legislature under the weighty sanctions of their united wishes, to do something for us. If the view which I suggest is esteemed impracticable, they may incorporate an agricultural society in each congressional district, and award a small sum to each, to be distributed in premiums, after the manner of New York and other states.

But it is objected that it will cost something. Have we not as a class offered our fleece annually, without a murmur, to be appropriated to other

improvements? Is it unreasonable that in turn we should require a small portion of our own to be applied to our peculiar benefit? A small portion of the interest paid annually by the University, would in a few years put our scheme completely in operation, and I verily believe after that it would be able to support itself. However, all these things might be discussed in convention, and digested in a form that would be most acceptable. And I may be permitted to add, that for once we should have a convention whose sole object would be the good of the country—a spectacle so singular in these times, that it could not fail to be as consolatory as the oasis to the weary traveller of the desert.

If you agree with me on this point, you can greatly promote the object by inviting the meeting in your journal. If I thought my name would be of any service, you would be at liberty to use it with my remarks. But I fear not. However do as you please. I have it much at heart to do something. Better heads than mine may suggest better plans, to which I will most cordially submit.

Accept assurances of my high consideration,

JAMES BARBOUR.

We concur entirely with the foregoing views and recommendations, and shall be pleased to aid them, as has before been attempted, through this journal. We are also clearly of the opinion that nothing in aid of agricultural interests, or agricultural science, is to be expected from our legislature, unless prompted and urged by the expressed wishes of their constituents: and therefore the more ready admission of the necessity, and probable advantages, of consultation among the zealous and intelligent friends of agriculture—either in the mode proposed above, or in some other. There is is no individual whose voice is entitled to be heard with more respect on this matter, than our correspondent; but it is desirable that others should also present their views, both as to the objects to be sought, and the mode of seeking them. Though willing to support, and lend our efforts to further any other plan of combining our force that may be found more pleasing to the greater number of the agricultural community, we see no reason now to object to the particular plan proposed above, viz: a meeting and free conference of all the members of the agricultural interest in Virginia, who may have enough zeal to join in the effort, for the purpose of determining on what aid of government agriculture most needs, and of asking it respectfully of the legislature. In the mean time the expression of different views on this subject, and discussing the comparative merits of the different ultimate objects in view, will greatly facilitate the operations of such an *agricultural conference*—and we invite to our pages, the expression of opinion of any of those who feel interest in this important subject.

It is hoped that the several societies will take the proposal into consideration, and give it their support. In whatever manner the meeting may be constituted, there can be no sound objection to the qualifications of any individual as a member. The agricultural interest in Virginia, however overlooked and neglected by the government, is still the *national interest*—and nothing can be derived for its benefit, by the whole or by any portion of those belonging to it, which would not be as beneficial to the commonwealth, as to agriculture. Such a meeting could not do otherwise than honestly labor for the good of the country—because that would be most effectually done by supporting their own. All bodies of men may be trusted implicitly when their private interest is to be promoted by the same measure, that will support that of their country—and none ought to be trusted when these interests are separate and opposed.

A STRANGE FISH.

A sea monster has been caught somewhere in the neighborhood of Norfolk, which is thus described by the Norfolk Beacon:

"Its general outline is that of a turtle, the fins or flappers being much longer. The whole fish is covered with a shining black cuticle or outer skin, (easily removed,) with the exception of the top of the head and the spinous processes of the back, which are white, with irregular outlines, as if it had been rubbed in three places. Immediately under the skin is a bony covering, extending over the back and down the sides, ridged with seven or nine bony prominences or spines, running nearly parallel with the back bone. The head is that of a turtle, with the upper lip or bill notched, so as to form two prominent pointed teeth or tusks. The throat and inner part of the mouth is fretted with spikes about two lines thick at the base, an inch long, of a horny substance, hanging loosely, but looking towards the throat, so as to permit a ready entrance, and completely preventing regurgitation, or egress. It measured eight feet in length, and nine feet from tip to tip across the fins."

From the Hartford Patriot.

ERIE CANAL.

In consequence of the great increase of business upon the Erie Canal, the Legislature of New York, at their last session, passed an act directing the Canal Commissioners to commence the construction of a double set of lift locks, as soon as in the opinion of the Canal Board the public interest should require it, and the enlargement of the Canal itself, the dimensions of the canal and locks to be determined by the Board. On the 30th ult. the Canal Board convened at the Comptroller's office, in the city of Albany, and adopted several resolutions, among which is a resolution that the public interest *does require* the construction of a double set of lift locks and the enlargement of the Canal. It was resolved to commence the construction of the locks immediately, and the enlargement of the Canal as soon as a sufficient sum shall have been collected from the canal revenue, to discharge the Erie and Champlain Canal debt—that the width of the Canal shall be in general sixty feet on the surface of the water, giving a depth of water of six feet. Several other resolutions were adopted for the purpose of facilitating the work. The Board adjourned to hear the report of the Engineers until the 20th of October next. The time required for

the completion of the locks from Albany to Syracuse is estimated at three years—and six years to complete the Canal. The enlargement it is supposed will be commenced in about one year. By this arrangement the width of the Canal will be increased twenty feet and its depth two feet. It is believed the expense of this great work will be paid out of the canal revenues by the year, 1845, which is the time fixed for the redemption of the original canal debt.

WHEAT AND CHEAT GROWING FROM THE SAME ROOT.

To the Editor of the Farmers' Register.

Pampatike, King William, June 22, 1835.

As there seemed to be a great difference of opinion sometime since in the Farmers' Register among some of the farmers with regard to chess or cheat in wheat, I think the following ought to decide the matter. My manager found this morning a bunch containing three heads of cheat and two of wheat, growing from the same root. It has always been my opinion that cheat was degenerated wheat.

THOMAS CARTER.

White Sulphur Springs, July 21, 1835.

DEAR SIR—Yours of the 28th ult. has just come to hand, and I am sorry the plant alluded to was not preserved, or it would afford me pleasure to send it to you. It was found by my manager, and not taken care of. He says he has seen the same thing before.

I am, yours respectfully,

THOMAS CARTER.

Being desirous of establishing truth, and not our own particular opinions, and considering with Mr. Carter that such a fact as this, fully established, would decide the controversy, we wrote immediately after receiving his first letter, to ask that the entire plant might be submitted to such scrutiny as would leave no suspicion of a mistake. This request was dictated by no doubt of the good faith either of Mr. C. or of the person who stated to him the circumstance—but by the remembrance of a mistake of our own making. Before having formed a decided opinion on this disputed matter, we once found a bunch of wheat, then just getting into head, and of which some heads were of cheat. The fact seemed conclusive: and if the bunch had been then thrown aside, after what was deemed close examination, we probably would have been always willing to swear to its truth, and of course to the fact of the transformation. But intending to preserve the bunch as a curiosity, and for permanent evidence, it was carried to the next brook to be well washed, so as to clear the roots of all the adhering dirt. In this operation, and without applying any force, or having any expectation of such a result, the roots separated, and showed two distinct bunches, so closely interlocked that they before had seemed to be one, and to have sprung from the same seed.

MANURE ON POOR SOILS. PUBLIC IMPROVEMENTS, AND POLITICAL JOBS.

To the Editor of the Farmer's Register.

Caroline county, Va. July 27, 1835.

Your remarks on my letter, (Farmers' Register, Vol. II. page 614,) have, I have learned, disheartened many farmers on poor land, and I assure you, sir, I saw nothing in them to cheer my spirits, or increase my ardor in attempts to improve lands naturally poor. The consumptive patient does not always despair after an unfavorable prognosis. "Hope ever lingers in the hectic breast." Your experience, it seems, as well as my own, goes to prove the difficulty, if not impracticability, of enriching lands naturally poor, (and exhausted too, by long cultivation) by vegetable matter alone. You have pursued the four, and I the three-shift system. You have fortunately found a remedy in *marl:* I have not. You seem now to pursue a course calculated to make amends for all your former errors and disappointments, as well as your toils and losses. In this situation, sir, I think you seem to abandon us to our fate, if not with disgust, at least with but little or no hope for our success. Without marl or lime, we are doomed to poverty or emigration: and to add to our sufferings, your "Commentator" laughs at our calamity. This is more than we can bear. *You* are elated with your discovery of the catholicon—*he* with a smile points you to the *opprobrium medicinæ*. Whatever may be the success of your panacea, we cannot but hope that the God of nature has provided other available remedies. Do not too hastily conclude that human genius and human effort must centre in lime. Do not believe that all lands naturally poor are doomed to their present condition without lime. Would you, sir, presume that you have fathomed the depths of nature, or spanned the circle of human ingenuity? Remember the story of the three clergymen and the setting sun in St. Piere's "*Studies of Nature.*" How do you know, sir, but your discoveries (and great I must call them) are but the platform: the mighty edifice is yet to be erected. Damp not then, I beg you, human effort; nor doom not to endless poverty the descendants of poor-land-farmers in our native state.*

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*We could not state our views more clearly than was done at the place referred to above (Vol. II. p. 614,)—and indeed, though condemning their having been so exprersed, our correspondent seems to concur entirely in their general correctness. When declaring that the putrescent manures alone, furnished by a farm of soil naturally poor, could not enrich it—and that calcareous matter being added *would* serve to produce that effect, certainly and profitably—it was not thought necessary to state also (what we now readily admit) that there may be other substances or means, though as yet unknown, which may serve the same or even a better purpose than calcareous earth. We then knew of one means only, and therefore spoke of no other. We were aware that the views expressed were likely to be unpalatable to many—and certainly the expression was not calculated to aid the popularity, or add to the profits of this journal. Our correspondent

When I spoke in my letter of lands originally poor, I enclosed in a parenthesis "*I may say compared with much.*" Now if most of those lands were poor enough originally "to make a rat cry," I do not know it; whatever they may do now. I had heard of one or two generations preceding the present, with large families, some of them buried in the forests of the west, and some of them buried by the sepulchres of their progenitors. As poor then as these lands may have originally been, as poor as they now are, should they be abandoned, without more than a *single* effort being made to restore them to their pristine, or a much higher degree of fertility? Last of all, should *statesmen* and *politicians* ridicule them? Should the farmer himself? Should the agricultural chemist? Not yet having discovered a system, a remedy, ought not this very failure to excite the compassion of the statesman and the patriot? Although, sir, I consider myself but a poor politician, I had reflected a little upon the condition of the farming interest of our native state, the bone and sinew of the commonwealth. I thought I had discovered that under the present system (or rather want of system,) our state was, and had long been, on the decline. That great numbers of her most wealthy and intelligent farmers had moved to the rich lands of the west and south-west, carrying with them their wealth, and intelligence or knowledge, which is said to be power, and left only their depreciated lands—whereby the sources of taxation for the support of all state expenses were daily diminishing. In addition too, the learned professions must necessarily have a more scanty support: and I had for years seen the young lawyer, physician, and perhaps the more useful divine, wending the same way. When, in fine, I saw a rapid decline of our state, both physical and moral, I was constrained to ask the political questions, with suggestions, from which, "Commentator" with so much kindness and confidence informs us that I "appear less at home." I hope "he will pardon me for saying," that after reading his commentary I am "of the same opinion still;" and I believe I am so, not because his views are "against my will." I feel no disposition, nor have I the information or ability to enter into discussion of this subject: yet I will say, that although I have not "consulted the most approved writers on the subject, nor statistical comparisons of the two methods of conducting internal improvements by private chartered companies, or entirely on state account," yet I should suppose after all that has been written by "the most approved writers," that there is opening for *two* opinions upon the subject, from the fact of some recent internal improvements (in other states) on the "state account" principle being in progress, or that "the most approved writers on this subject" must have very recently come to light.

As regards the trial of our sister state who has involved herself in a debt of some fifteen or twenty millions of dollars, I conceive the trial as yet by no means concluded. "Commentator" may suppose after the completion of these important works, the tolls will never be sufficient to pay the interest and necessary expenses, much less to extinguish the debt or loan. If so, the trial will be conclusive. Should the tolls not only pay the interest and expenses, and extinguish the debt, and ever after bring a handsome revenue into the state treasury, then I suppose "Commentator" would not object; even too, if many of those undertakings have been made poltical party jobs, with incompetent undertakers and superintendents, and the expenses much greater than those of any private company or companies. I say so for this reason, that where a *state* undertakes all these internal improvements, some of them might fall far short of expectation, and be unproductive, either after the strongest presumptive evidence that

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knows well that the physician who would always honestly tell his patients when he considered their diseases past the aid of his skill, or who refused to prescribe for what he knew to be incurable maladies or infirmities, would soon lose his practice. The rule applies as well to land doctors, as to body doctors. As there are plenty of the latter who will always give their patients *hope*, even when *help* is out of the question, so the great body of prescribers for the diseases of soils always promise relief, and a state of vigorous health, and to be gained easily, cheaply, and profitably. Such flattering promises are always more impressive than statements of opposite character—and if any readers desire to get rid of all despondency produced by our former croaking, let them read the first address to an agricultural society that comes to hand—and ten to one, but they will find the proper remedy, in the prospects exhibited, of certain, speedy, and cheap agricultural improvement, on the poorest and most intractable soils.

But for our part, we cannot hold out what are believed to be delusive hopes—and we consider that the only solid expectation for a cure must be founded on the full knowledge of the malignity and strength of the disease, and of the nature of the medicines proposed to be used. We do not say to the tiller of naturally poor soil that there is no hope for fertilization or profit—but that he will fail in reaching both, if reliance is placed solely on not grazing, and otherwise applying putrescent manures.

But even if any region is so situated, that making the soil generally fertile cannot be reasonably expected, there are particular kinds of products which might be there obtained, and yield as much profit as an equal amount of capital vested in richer land elsewhere. Much of the land of New England furnishes examples of this truth. The soil is so destitute of lime, that it is not only naturally poor, but is incapable of producing wheat to any profit. Yet these lands yield great profits, and command high prices. Two of the most profitable parts of agricultural business pursued there, are silk culture and sheep raising—and both of these are much more opposed there, than here, by the long and severe winters. These are only named as examples. In Virginia, we scarcely ever think of a change of crops, products, or habits, no matter how much required by difference of soil. We almost every where aim to raise corn, wheat, oats, tobacco, or cotton, for market—and seem to have no choice except among those very few of all the numerous and varied productions of the earth, and of agricultural industry.

they would be profitable, or from incompetent undertakers and superintendents, and exceeding great expense: yet when the whole be completed, if the result be an income not only sufficient to pay off the debt and expenses, but to relieve the citizens of the commonwealth from direct taxation, what more could be wished.

The last important objection with "Commentator" is, that "almost all matters of internal improvement when undertaken on public account, are forced to subserve, in locality, in the choice of agents to conduct them, and in the expenditures lavished on them, the popularity of the occupants for the time being of political power." This I presume would be true in a greater or less degree. This, however, is one of the evils attendant upon fallen man. It may be traced to the principle of self-love, which prevents men from doing unto others, as they would that others should do unto them. As these favors depend upon the *occupants* for the time being, and the occupants depend upon *popularity*, and popularity (I am truly sorry to say it) upon the *wind*,* and the wind blows from different points in a short time, so it may not be long before these favors are pretty equally divided. At any rate I see no good reason why through fear of partizan favors, varying with the popular breeze, we should have all the control, profits and emoluments (which may be great) permanently fixed upon a few individuals and their heirs, instead of the profits being thrown into the public treasury for the common weal. When I penned the questions above alluded to "on certain topics of political economy," I had not the smallest expectation of ever hearing of them again. Yet as they have been thought so erroneous by "Commentator" as to excite his attention, and as I verily believe with a view of correcting the error; and as he has failed to convince me, I thought it but proper to state some of the reasons why I had not yet embraced his views. I assure you, sir, as I have before said, that I am no great politician. I should be unwilling to introduce the subject into your paper on party grounds, and should be sorry to see it in these days of excitement, introduced by others far before me in political acquirements. I hope so far as we have gone, we have not transcended the limits of political economy—one of the branches not improperly introduced for the general good.

If I have wandered from "home" into a wilderness, I have met with a native of our own state, (in No. 3, Farm. Reg. pp. 138, 140,) whose company cheers me in the desert; who, upon the subject of the improvement of the James and Kanawha Rivers, says: "I have no hesitation in saying it would have been better for Virginia to have borrowed the whole sum instead of raising it at home by subscription; for I have no doubt that the tolls on the improvement will ultimately pay much more than interest on the money expended, &c." Again the same writer, Professor Dew, says: "I do not, however, by the remarks made, wish to be considered as censuring those who favor the joint-stock scheme of our state. It was the only plan perhaps which could have been successfully carried through, and therefore ought certainly to have been supported rather than leave the state without any improvement at all."

T. B. A.

P. S. My remarks have run in rather a different channel from that I had intended. I wished to have speculated a little upon your theories in your work on Calcareous Manures. I wished also to ask the favor that you would collect and publish in your Register, the best information upon the use of quicklime upon different soils.

From the last London edition of the "Complete Grazier."

ON THE BREEDING, REARING, AND FATTENING OF SHEEP.

[Continued from p. 222 Vol. III.]

On the treatment and rearing of house-lambs.

In the preceding chapter, the treatment of lambs intended to be kept for stock, has been chiefly regarded; but, as the price given in the winter, in the metropolis, and in other places where there is a demand for young lambs, is often very considerable, we shall, at present, confine our attention to the rearing of those animals, under cover, in which case they are denominated *house-lambs*.

In this branch of rural economy, two circumstances are worthy of notice: 1. To put the rams and ewes together at such a time, that the lambs may fall at the proper season; an object which may be easily effected by any skilful shepherd: and, 2. That appropriate places be provided for their reception. Where the suckling of house-lambs is intended to be regularly followed, it will be necessary to erect a house of such proportions as the probable extent of the business may require, and to divide the building into pens, in order that each lamb may be more conveniently suckled; but when it is not a primary object of attention, any airy building may be made to answer the purpose. Care should also be taken, not to crowd too many into one house at the same time; as the increased degree of heat, thus occasioned, will render the place unwholesome.

The breed of ewes, best calculated for producing house-lambs, is the early Dorsetshire sort, particularly those whose lambs die *fair*, in the language of the market; i e. whose flesh is of a delicately-white color: and from this prolific variety the demands of the luxurious in the metropolis are supplied. The dams are fed with hay, oil-cake, corn, cabbage, or any green food afforded by the season; which is given in an inclosure adjoining the apartment where the young lambs are confined. The light is excluded from the lambs excepting at the intervals when the shepherd suckles them upon the ewes; and some feeders confine them in separate stalls in order to prevent them from playing, and thus promoting their fatting, but others deem the exclusion of light to be sufficient.

Where the system of suckling is carried on to a great extent, it will be advisable to mark the lambs, in order to ascertain which has been longest sucking on the *bastard ewe;* (i. e. such as

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* We think that our correspondent does great injustice to the *wind* in making it the cause of such effects. The wind is honest and "straight forward"—and, whether it is doing us good or harm, we can at least always tell which way it is blowing for the time being.

suckle strange lambs,) as such lambs ought to *suck a-head*, or be permitted to take the first milk. There is great difficulty in compelling the ewes to suckle strange lambs; but when they have lost their own by accident, they may be deceived by stripping the skin from the dead lamb, and stitching it round the body of a live one.

In the intervals of suckling, some wheat straw may be given to the lambs in racks, either with wheat or bruised peas in troughs, together with a piece of calcined chalk for them to lick, but as the ewe's milk is the chief support of their young, especial care must be taken to supply her with turnips; or, in case these or other roots cannot be procured, besides turning her into a good warm pasture, she should be fed with brewers' grains, to which may be added a little hay, oats, or bran; but the last mentioned articles are greatly inferior to turnips, or any of the succulent roots, in producing a flow of milk.

The ewes ought to be conducted to the lambs three or four times in the day, at nearly equidistant periods; and if any one have a more than ordinary flow of milk, she may be held by the head, while a second lamb draws the udder. During the whole of the treatment, the strictest attention ought to be paid to cleanliness; to promote which, the pens should be well littered with fresh straw; and, by this simple expedient, the animals will, if kept free from all disturbance, speedily fatten, and their flesh becomes exceedingly white and delicate. Some estimate may be formed of the profit arising from rearing house-lambs, from the prices given *per quarter* in the London markets. These, retail, vary from ten to fifteen, or twenty shillings, according to the demand, so that each lamb sells at from two to four pounds; though the prices afterwards gradually decline, till the ensuing spring affords an abundant supply for the table. Yet, whether from the great trouble of the requisite attendance, or from the precariousness of the result, it is a remarkable fact that, notwithstanding the increase of population, the rearing of house-lambs has, of late years, materially fallen off.

On the feeding of sheep.

The successful feeding of sheep must greatly depend on the quality of the pasture intended for their reception, and upon the resources which the farmer has for supplying them with food during the trying winter months. Hence, as already intimated, it will be necessary to suit them to the pasture, and on no account to purchase or procure sheep from the grounds of a superior quality to those which are destined for their support. With sheep, as with other cattle stock, it has been found that the larger breeds are calculated only for the richest and most luxuriant grounds, while the smaller sorts are best adapted for the less fertile tracts, where the grass is shorter; and as the breeds that are most beneficial for particular situations are detailed in the introductory view prefixed to this book, we deem any further remark on that subject unnecessary.

In the grazing of sheep, as well as neat cattle, various methods are practised, and with different success. Thus some farmers buy two, or three-shear wethers, early in May, which, for several weeks, are indifferently kept till all the grass has been mown off the meadows, when they are turned into the rowen, and are afterwards *forced* or fattened off on turnips, hay, and oil-cake, during the winter months, so as to be fit for sale at the commencement of march. This practice is very beneficial, if conducted with care, as mutton fetches the most advantageous prices in that month.

Others purchase pregnant ewes towards the close of summer, or early in the autumnal quarter; and keep them on inferior grass lands, stubbles, or fallow, till the beginning of the following year, when they are kept in good condition through the lambing season, and after that in the best manner that circumstances will admit; so that the lambs may be ready for sale in sufficient time for the dams to be fattened for the butcher early in autumn.

Another profitable practice on good soils is, the buying of lambs of forward breeds, about the end of August, or in the beginning of the following month. The animals thus acquired are, by some graziers, kept in an indifferent way throughout the winter, till the following spring, when they are turned into rich pasture, and fattened so as to be ready for sale before Christmas, at which time the whole stock are cleared off the land. Others however, adopt a system altogether the reverse of this: having purchased the sheep, as already stated, they force them with the best keep that can be procured, and dispose of them as quickly as possible. Each of these plans has its separate advocates; they are all good; and the preference to either can only be determined by relative circumstances of soil and situation, the quantity and the nature of the feed.

In grazing sheep, the fine grasses produced on downs are, undoubtedly, the best and most congenial food for these animals; and, on such soils, both the finest wool and the best mutton are produced; but in order to bring sheep forward at an earlier age than would be possible on such herbage, and for the larger breeds reared on lowlands, richer pasture is necessary: good hay alone will fatten wethers; but they may be yet more advantageously prepared for the butcher by means of grass and hay together. Great attention, however, is necessary, that sheep be kept from all grass that is grown in marshy places, otherwise they will become affected with the rot. And here it may not be amiss to remark, that the late Mr. Bakewell attributed this fatal disease solely to flooded lands, and the premature, but unsubstantial, herbage afforded by them. Whenever, therefore, particular lots or parcels of his sheep were thus affected, his practice was to fatten them for the butcher; and, probably from motives of jealousy, in order that he might be certain the animals would be killed, and not got into other hands, he was said to rot them before they were disposed of. This he effected by overflowing a pasture or meadow in the summer, in consequence of which the soil thus flooded inevitably rotted the sheep that were fed on it in the ensuing autumn: but this, it should be observed, does not apply to irrigated land, if properly managed.*

Beside humid situations, and the acid grass vegetating there, the tufts of long, rank grass that usually spring up after horse-dung, are injurious, unless the grass has been previously exposed to a few nights' frost, after which they may be turned

*See Book VIII. Chap. XI.

in without danger. It is also improper to suffer sheep to browse upon fallows that are wet and unsound, as they frequently pull up unwholesome herbs by the roots, which they eat with the dirt adhering to them. This has been thought to give them the rot; though there is much reason to doubt the accuracy of that supposition, which, indeed, is manifestly at variance with the fact, that sheep fed on turnips, with which they necessarily lick up dirt, are not thereby affected with it, though they may be injured by the weeds. The origin of the rot, so far as it has been ascertained, is solely attributable to the wetness of the land on which sheep are fed; and its immediate effect is the production of insects, termed *flukes* or *flowks*, which prey upon the liver; but whether these are generated in the animal by the nature of the food, or are derived from animalculæ absorbed with it, is still unknown. It is observable that salt marshes are exempt from this malady; and therefore salt has, not unreasonably, been conjectured to afford a preventive, but its effects have not been sufficiently tried: the best is a dry pasture. In such pastures, however, as are subject to give sheep the rot at certain times, it will be advisable to let the lambs run with the ewes; the longer the better; for though these tender animals are more susceptible of injury in these unsound places than full-grown sheep, yet they are seldom attacked with the rot, suckling having been found a preservative against it.

In turning sheep into pastures, particularly water-meadows, and also into those places that are subject to rot, it will be necessary to pursue the same precaution as with neat cattle, viz. previously to satisfy the craving of appetite, by giving them hay or cut straw; and, after the dew has been evaporated by the rays of the sun, to drive them gently round the field for two or three hours, before they are suffered to feed. But, whenever any sort of dry food is given, they ought to be supplied with pure water, particularly during the intense heat that usually prevails during the *dog-days*, and which often renders the grass as dry as subble. For this purpose, clear, light running water is always to be preferred, where it can be obtained; though, in general, whatever water presents itself is made use of.*

The best time for turning sheep into summer pastures is in May, when every attention should be paid to proportion the number according to the luxuriance of the grass; and, as these animals are with difficulty restored to good condition when injured by want of sufficient food, it will be advisable rather to understock than to overburthen the land. It is, however, worthy of notice, that by pursuing a system of *close feeding*, the plants will be prevented from running up to seed, and those grasses, which are naturally coarse and unprofitable, will thus be kept down, and become sweet and valuable. The number to be allotted to an acre depending on the weight of the stock, the richness of the soil, and the forwardness of the pasture, it must be evident that no general rule can be applicable to this portion of management, which must be wholly regulated by the combination of those circumstances.

Of late years, it has become a frequent practice to soil sheep during summer with the various artificial grasses, and to supply them with corn, as well as green food, during winter. In this view, barley-meal, when abundant and cheap, may be advantageously combined with green meat, and will speedily fatten wethers: pulverized oil-cake has also been given; but has been objected to, as it is apt to impart a peculiar flavor to the mutton. Pea-haulm is much relished by sheep; and potatoes, particularly if steamed, would rapidly contribute to fatten them, were not the operation attended with two much trouble for the feeding of a flock. Borecole and burnet also supply an excellent food for sheep during the winter, particularly towards the close of that season; but in most situations turnips form the farmer's chief dependence for the winter-keep of his sheep-stock.

There are various methods in the use of giving turnips to sheep. By some farmers, they are promiscuously turned into a field, and allowed to eat the roots at pleasure; either previously picking these out of the ground for their use, or leaving the sheep to do that themselves. Others divide their land by hurdles, and inclose the sheep in such a space as these can clear in one day, advancing progressively through the field till it is cleared. But, in either case, care should be taken not to turn them in until the dew is off in the morning, as by their eating the turnip-tops they would be subject to become hoved. Another method is, to pull up such a quantity of turnips as they can consume in a few days, and cart them off the land to the sheep pastures; and in wet weather, or when it is an object to feed off the turnips on the ground on which they are grown, this is an advisable mode.

Each of these methods has its advantages; but a more profitable plan than either, is to eat off the crop by two successive flocks of fattening and store sheep. By allowing the first the range of the field, they will scoop out such turnips as they prefer, and will thus satisfy their appetites better than where the turnips are dug up: a most material point, it may be observed, to be considered in fattening all cattle, which should always be indulged, when that is possible, with such food as they prefer. The store sheep may then follow, and the roots and pieces left by the former should then be taken up for their use. One man with a common picker, used for the purpose, will turn out and break as many as will serve a large flock, and his hire will be more than compensated by their being eaten

* The watering of sheep is on the continent, regarded as a circumstance of the greatest moment, and accordingly receives that attention which it requires. Thus in Sweden, and at the national farm at Rambouillet, in France, they are daily watered with running water, or with that obtained from lakes and springs; stagnant water being most properly and rigorously prohibited. In some of the Saxon sheep-farms, the sheep are watered in the cots or folds during the winter, instead of taking them to watering-places. Spring or well water is conducted, by means of pipes, into troughs, out of which the sheep drink at pleasure; they in consequence drink oftener, and each time take less water, which is favorable to their health. The ordinary mode of watering sheep in that, and, we may add, in many parts of our country, is attended with many inconveniences. The animals refuse to drink water in the winter, if it be too cold; they hurry while drinking; and do not take enough when the weather is very windy, or hail, rain, or snow falls. Besides which, they often disturb the water with their feet; this disgusts them, and at length, one part of the flock completely prevents the other from approaching the watering-place.

clean up; while, if that were done by the fattening flock, it would perhaps rather check than forward their improvement. When the turnips are hurdled off to be eaten on the land, they should always be taken up; as otherwise, in so small a space, they would be trodden under and spoiled; if not taken up, the sheep should be allowed more room.

But the fattening of sheep cannot be conducted to advantage without regularity in distributing, and economy in the management of, the various articles that compose their food. Hence it will be found useful to have troughs, with partitions in the middle and racks annexed, about two feet high from the ground, the whole being firm and steady, so that it cannot be overturned.

The sheep-cribs and racks in common use, are too well known to require description. Considerable benefit may be derived from their adoption for the purpose of feeding sheep; for it not only effects a material reduction in the consumption and expense of provender, which is thus prevented from being trodden under foot, or soiled with dung; but also, in this state of separation, the stronger sheep cannot drive away the weaker, as each is secured by the head.

But whatever system of management may be adopted by the farmer, whether at home or in the field, he ought on no account to withhold salt from his sheep; for not only does the continual use of that article contribute to the digestion of succulent vegetables, and of course preserve the animals in constant health, but it is also said to improve both the quantity and the quality of the wool, and it ought to be particularly used in those moist situations, the produce of which is liable to rot sheep, of which malady it is affirmed to be both a preventive and a cure. Rock-salt is undoubtedly preferable; but, where this cannot be conveniently procured, it will be advisable to dissolve common salt in water, and after mixing it with fine, pure clay, or with pulverized and sifted chalk, to form the whole into masses or lumps, which may be placed under shelter, so that the sheep may lick it at pleasnre.

The importance of salt in preserving the health of sheep is not generally known, or appreciated, by many breeders of this island, who do not give it in any form. The same prejudice exists in Prussia and Holland, where no salt is allowed to these animals.* On the contrary, at Rambouillet, in Silesia, Saxony, Sweden and Spain, salt is considered as a most important article, and the use of it is most strongly recommended. In Sweden, they give salt, particularly in rainy or damp weather, and frequently add to it wormwood, or some other bitter vegetables, juniper seeds or berries, and even pitch, which articles are reduced to powder, and, after being diluted with water, are carried to the sheep house, and put into the trunks of trees, which are excavated expressly for this purpose: the preparation is considered as an excellent preventive of several distempers, particularly the dropsy, to which the Swedish sheep are very liable. In this country, the high duty on salt has hitherto prevented its employment for many agricultural purposes, to which it might be beneficially applied; and to none more advantageously than in the feeding of cattle; but as that objection now happily, no longer exists, it is to be presumed that it will be gradually brought into use.

The preceding statements have been given chiefly with reference to the fattening of sheep profitably for the market; but it ought never to be forgotten, that the growth of the wool is liable to be materially affected by the system of feeding pursued. It is essential to the evenness and strength of the staple, that the feeding of the animal should be uniform, without any sudden interruption or transition: for, where this is suffered to take place, the natural progress of the wool is checked; a second growth succeeds; and the point of contact becomes so weak as to snap under the operation of the manufacturer; who, being aware of this disadvantage, cannot of course afford such a price for wool of this description, as he could for that of a more perfect staple. Much wool is injured in this way between summer and winter keep, which should be made to blend as gradually as possible, that the mischief above described might be prevented, and a sudden transition from rich to poor diet or from poor to rich keep, ought carefully to be avoided.

[To be continued.]

*In Holland, the use of alder leaves, which the sheep eat with uncommon avidity in wet weather, is said to prevent the rot.

From Loudon's Gardener's Magazine.

TO PRESERVE CELERY THROUGH THE WINTER.

Get up the celery on a fine dry day before it is injured by frost, cut off the leaves and roots, and lay it in a dry, airy place for a few days; then remove it to a cool cellar, where it will be quite secure from frost, and pack it up with sand, putting layers of celery and of sand alternately.

STEAM-DIGGING MACHINE.

M. Wronski, a celebrated mathematician at Paris, has, according to the Paris papers, discovered a new system of applying steam to carriages, digging machines, hoes, picks, ploughs, &c.; so superior to any thing hitherto known, that a French company has bought his patent for four millions of francs.—*Le Temps.*

From the Farmer and Gardener.

LIMING IN LEHIGH.

In speaking more particularly of Lehigh county, it may be assumed, that the introduction of the use of lime in farming, and the culture of clover about 20 years ago, wrought a most salutary revolution, and saved the second and third rate lands from being deserted for the far west. Ever since that period agriculture is rising. Every summer adds to the number of solid and capacious barns, and old ones are enlarged. A considerable part of the county, especially on the borders of the Lehigh and its tributaries, is limestone land, but the trouble and expense of carting the stones the distance of 14 miles is not thought too much, thus almost the whole of our county is provided with this commodity. As soon as winter sets in, or as often as during summer the other farm operations are suspended, the quarries present a lively scene, and wagons or sledges are seen toiling along up

and down through the country, broken and hilly as it is in many parts. The consequence is, that you see beautiful farms not only in hollow lands, but in situations where you never would look for them, on the tops of the mountains as well as on their declivities. Wheat however is not the only staple article; we produce a great quantity of rye for sale and home consumption, for man and beast; for be it remembered that we eat rye bread in preference, even when we have both sorts on the table. The effect of lime upon rye land is quick and immediate, hence whoever is improving his land begins with rye. On the Lehigh land quarried limestones are sold at the quarries for 25 cents per ton. In other sections, the common way is for farmers to do all the labor themselves and pay to the owner of the quarry 6 cents for every ten bushels of quicklime they draw from the kiln, or they engage hands paying to them from 1 to 1½ cents per bushel of quicklime, the hands to find their own tools and powder where necessary—this is in addition to the fees of the owner of the quarry. The work at the kiln to be done by the farmers. If you wish to buy quicklime you can have it deposited on the fields at ten cents per bushel and upwards, according to distances. We put from 40 to 60 bushels on the acre, repeating the operation every five yeas. From the time that stone coal from Mauch Chunk has been furnished in abundance along the Lehigh canal, and that its use in burning lime has been understood, agriculture has received a new start. Previously, the scarcity of fuel—though rather prospective than actual, operated as a check upon the universal use of lime. Now the coal is mixed with the lime stones, and no more wood is required but what is necessary to ignite the coal, which may be done with 1 or 1½ cords, thus not only a mass of fuel is saved, but a great deal of hard labor—the coal when once fairly burning requiring no farther attendance.

Timothy is not much raised on dry land, as its effect upon the land is not so beneficial as that of clover. Common rotation, 1st. clover, 2d Indian corn, 3d oats or flax; and potatoes, manure, 4th wheat, 5th and 6th clover, 7th wheat, without manure; 20 bushels of wheat—50 bushels of Indian corn, 2 tons of clover per acre, are good crops, though there are many instances of more having been produced. Average somewhat below this.

For the benefit of such as wish to sprout a few seeds of gama grass, let me add my recipe. Split the seed with a small chisel, put the kernel in a tumbler with sand, keep it moist, and in 3 days, if the seeds are not covered too deeply, the grass appears. The splitting is easily done. The seed of gama grass is in the shape of a cylinder, on the surface of which you will observe a spheric triangle, two sides being formed by seams, and the third by the base of the seed, but the two sides or seams, one not quite connected with the base, make the connection with the chisel or knife, and the triangle will fall out like a trap door, the kernel adhering to it; take care not to separate it further, or injure it, which is very easy to avoid.

From the Tennessee Farmer.

TO DESTROY BRIERS.

We are assured by a respectable and intelligent farmer, that from the repeated experiments of himself and his neighbors, he is able to state with confidence that briers, both the blackberry and dewberry, will be effectually destroyed by cutting them down or ploughing them up when they are in full bloom, which is ordinarily in the month of May.

From the Tennessee Farmer.

SAVING CLOVER SEED.

Answer to Queries of a subscriber published in the Farmer No. 6 page 91.

The two great objects to be attended to, in raising clover seed with profit, are—first, to secure the production of as large a crop to the acre as practicable—and secondly, to harvest the crop in such a manner, as to bring as large a portion of the seed into the barn and to leave as small a portion of it as possible in the field.

To attain the first object, that of securing a large product, we have in our preceding numbers, in observations on the culture of clover, given the necessary directions; we will now only repeat, that the main things to be attended to are the following—1st. That the land be fertile. 2d. That it be well prepared before sowing the seed, as heretofore directed. 3d. That a sufficient quantity of seed be sown to the acre. 4th. That it be evenly distributed over the ground. 5th. That, whenever the land requires its aid, gypsum or plaster be sown on the clover—and 6th. That it be not injured by injudicious or excessive grazing. If these particulars be well attended to, an acre of ordinary land will produce three bushels of seed in a common season, often more.

We come now to speak of the more difficult and laborious operation of safely and economically harvesting and securing it. This requires care and attention. The great objects to be aimed at are, to cut the seed at the period when there is the largest portion of the ripe seed on the ground, in that stage of maturity, which will admit of its being collected into the barn, and so to handle it, as to prevent the seed from being shattered off and left on the field, while the straw or haulm only is collected in the barn. It is, we believe to the improvident and ruinous neglect of strict attention to these two latter objects, that most farmers may attribute their failure in making clover seed. We will lay before our readers the results of our own observation and experience, on these important points, hoping that those of our patrons, who may have discovered a better mode of effecting these objects, than the one recommended, will yet communicate to us their practice in time to enable us to lay it before the public in our next number.

Time of cutting.

As the clover seed, from the time the first heads ripen, until the close of the season, are daily arriving at maturity, the great desideratum is, to ascertain the precise period when there is on the ground the greatest portion of ripe seed, in a state which will admit of its being collected and brought into the barn. If the clover be cut before this period, there must evidently be a loss sustained, from the immaturity of too large a portion of the seed. If the cutting be deferred beyond this period, an equal, and perhaps a greater loss will be sustained,

from the impossibility of saving the seed first ripened, generally the best, on account of its being so easily shattered off. We would recommend, as the most eligible time for cutting, the period when about two-thirds of the heads have become ripe and assumed a black color, many of the others, at this time of a brown color, will ripen after cutting.

Mode of cutting.

Where the clover has not lodged, and is high enough to admit of it, by far the most expeditious, and in every point of view the most eligible mode of cutting, is to cradle it as we do grain, only throwing it into double swarths, that is laying the clover cut from two lands in one swarth. If the grass be so short as to require it, a strip of linen may be fastened on the fingers of the cradle so as to prevent the heads falling through them.

Mode of curing.

If the crop be not heavy and the weather be good, the swarths may lie undisturbed for several days, until the hay be perfectly cured, it should then, in the morning or evening while sufficiently moist from the dew, to prevent its shattering off too easily, be gently raked into small bunches, such as can be conveniently raised with a fork and laid on the wagon. When not too damp, these bunches should be hauled to the barn, and either stowed away in mows, or, which is best, thrashed off, and either immediately cleaned, or else the heads stowed away in a room prepared for the purpose until winter, to be then thrashed or trodden out. But should there be rain on them, or should they be suffered to remain in the field any considerable length of time after being raked up, these bunches must with a fork be gently turned bottom upwards, and laid in a new place, after every rain to which they may be exposed, and after every two or three days they may have lain in the field in fair weather. This is necessary to prevent the seed from being injured by the heat and moisture to which they will have been exposed, from the sun, the rain, and the moisture of the earth. After being sufficiently cured, while dry, let the seed be gently laid on the wagon or sled, and hauled to the barn, using every necessary precaution to ensure, that as little of it as possible be left in the field or scattered along the road.

Mode of cleaning.

Various methods are practised, for cleaning the seed from the chaff. The only two as far as we know, used in this country, are treading it out with horses, or cleaning it in a thrashing machine: The first is tedious, laborious, filthy and unwholesome both to man and beast, the latter is far preferable in every respect, but as all are not provided with thrashing machines and as therefore many must still continue to tread out their seed we will submit a few observations on the mode of performing this operation. Having covered the barn floor with seed in the chaff to the depth of from 12 to 18 inches, put on the horses and tread one day, the next morning run the chaff through a fan, much of it will have been beaten to dust and will be blown away, as will also the light chaff, having no seed, and that from which the seed has been separated, but much the larger portion of the seed, still enveloped in the chaff, will be found in the rear of the fan, this, having been separated from the empty chaff adjoining it, must be again spread on the floor and having added another portion of untrodden chaff, the horses must be again put on and made to tread it another day when it should be again run through the fan as before, the produce of this, will far exceed that of the first day's treading, but still, much good seed will be found immediately in the rear of the fan not yet separated from the chaff—this must be again spread on the floor, and a new addition be made of untrodden chaff, and this process must be repeated until the whole crop is trodden out. The seed, after passing through the fan, should first be run through a sieve, sufficiently coarse to permit the clover seed to pass through, but retaining all larger seeds and trash. It should then be again run through a finer sieve, retaining the clover seed, but permitting the passage through of all smaller substances, by these two processes, the clover seed will be thoroughly cleansed from all kinds of filth and prepared for market. The only advantages derived from cleaning the seed rather than sowing it in the chaff, are the ascertaining with greater certainty the quantity sown and the ensuring a more equal distribution of the seed—where therefore, a sufficient quantity can be afforded to insure the desired thickness in every part of the ground, sowing in the chaff, will not only do as well, but is to be preferred, as it is believed more likely to come up and to stand.

From the Silk Culturist.

SEED TIME FOR THE MULBERRY.

South Coventry, (Conn.) June 25th, 1835.

Sir—The scarcity of mulberry seed the present season having prevented many persons from sowing nurseries in the spring, I take the liberty of informing them through the medium of your paper, that from experiment, I am satisfied that the month of August is a suitable season for sowing the seed. If sown any time during the month of August the seed will vegetate quickly, and by the time of the early autumnal frosts, the plants will have grown to the height of three or four inches. They may then be easily covered with straw and horse manure, which will sufficiently protect them through the winter. In covering them but little straw should be used, otherwise, the rats and mice may be induced to burrow in it, in which case they will most assuredly destroy the plants. If the seed is sown at this season and protected in this manner, they start early the following spring, grow vigorously through the summer, and by autumn attain about the same height as though sown the preceding spring. Another advantage from sowing in August is that seed of the same year's growth may be obtained, which is more sure to vegetate.

J. W. BOYNTON.

SELECTION OF SEED.

* * * The important topic, of the selection of seeds, opens this number, [of the New York Farmer] examples are quoted to show that the successive selection of seed from choice

plants grown in the same situation, is to be preferred to any benefit which changes of seed from distant localities can produce. We in the South practice on the opposite system very extensively; the planters of Bayou Bœuf grow cotton seed from Mexico, and furnish seed to the planters of Petit Gulf; these in their turn supply Louisiana, Mississippi, and Alabama, and from them our Petit Gulf cotton seed comes—gradual changes take place in its character here, and the genuine variety is kept up by annual importations.

It is not to be doubted that instances occur of remarkable improvement both in the quality and quantity of our rice crops upon the use of North Carolina seed rice. And it has been the settled habit of our rice planters from the commencement of that culture on our River Swamps, to draw their supplies of seed from the Inland Swamps; this shows a deep conviction of the advantage derived from change of seed.

On the other hand, Mr. Gibbes, of Chester district, in this state, grows corn known there as the three eared corn, which his neighbors buy for its prolific tendency; this he obtained by selecting stalks having three ears; and every body knows that of late our Sea Island planters have been zealous in the selection of fine samples from their crops for seed; so far was this intent examination carried in one instance, that the long use of magnifying glasses, to aid in selecting the finest fibre, threatened blindness to one gentleman of John's Island, as we are told, he is rewarded by sending to market a "fancy brand."—*South. Agr.*

For the Farmers' Register.

DESULTORY OBSERVATIONS, AND INQUIRIES, ON THE IMPROVEMENT OF LAND.

Charlotte, Va. Aug. 1, 1835.

We are disputing in this section of country whether the three or four-shift system is most suitable to our lands, and I propose making a few remarks relative to this question, as well as some desultory observations on other matters connected with the subject of agriculture.

In order to arrive at any thing like accurate conclusions, it is necessary first to define the terms three and four-shift system, as used in this communication. By the three-shift system, we mean a farm divided into three equal parts, cultivated successively, one year in corn, one in oats, and one in grass. By the four-shift system, we mean a farm divided into four equal parts, cultivated successively one year in corn, one in oats, and two in grass. From this it will appear that on the three-shift plan there is in fact but *one year's rest*—and on the four-shift plan only two—which in my humble opinion, is but a slender chance for *improvement*—that is, where we depend on *grass alone.*

The farm on which I now reside, has been under what is called the four-shift system, for something like fourteen years—eleven of which, I can safely say, there has been little or no grazing during the spring and summer. Occasionally in the months of November and December I have permitted my cows, and sometimes a small head of horses, to glean the fields. My stock of hogs never yet enjoyed the pleasure of the harvest field more than twice or thrice during the fourteen years; and strange to tell, I have never bought pork or bacon, except the two first years of my little farming career. The different shifts have been tolerably well set with herds grass or clover, (wherever either of these grasses would grow) for the greater part, if not the whole time above mentioned. Still my lands are poor and unproductive—and I am now in what is commonly called a *quandary.* Shall I continue my efforts on the four-shift plan—or shall I abandon all hope, and try the three-shift system?

It would, Mr. Editor, be a source of much gratification not only to the writer of this article, but also to many other readers of your valuable Register, to see this subject fully discussed by some of your able and practical correspondents from the tobacco growing country. The excellent remarks already published in your columns, relative to the three and four-shift systems, apply more particularly to the wheat growing country. My opinion, though entitled to but little weight, if any, rather inclines to *change*; and the reasons which influence my mind in relation to this important subject, will be candidly and plainly submitted to you and your readers.

The first which suggests itself in favor of the three-shift, is, a greater proportion of the best land of the farm will annually be brought into cultivation. Now, in order to elucidate this idea as clear as possible, let us take for example, a tract or farm containing 320,000 corn hills, and where tobacco, corn and oats are cultivated, (as is common here) 8,000 per hand of each, is considered fair cropping for an average parcel of hands, although 10, and sometimes 12,000 per hand is cultivated. This 320,000 divided into four-shifts, and worked by ten hands, gives four shifts of 80,000 each. If the same farm be divided into three-shifts, and managed by the same force, we have three shifts, containing about 106,000 hills each. Out of this we may select the best 80,000 for the year's work. The remaining surplus of 26,000 may be sowed down in small grain, which will not materially interfere with, or affect the general management of the crop; or it may be suffered to *improve* by *rest*, and be occasionally cultivated, as time and circumstances may direct. From this view of the question, it would appear a matter easily decided: but then another question arises—does the land improve as much when cultivated once in three years, as when cultivated only once in four? Experience, as already remarked, is but a small inducement with me to hope for much *improvement* to our common lands from *grass alone;* and we may add to this, the combined advantage of non-grazing and deep ploughing. These remarks are intended to apply only to the common corn land of this section of country, or to lands of a midling quality, for there is not the least doubt that fresh land of good quality, or even old land in good heart, under judicious cultivation, with the use of clover, may be not only kept up to its original fertility, but is susceptible of a high degree of improvement. But on the common corn land let me ask what is the improvement of three or four years worth, when, as before remarked, that of ten or a dozen is scarcely perceptible?

Another advantage which the three-shift system possesses, consists in the great saving of labor both in the preparation and cultivation of the crop. It generally requires the greater part of my hands to shrub and clean up the briers, bushes, &c. nearly the whole time of the ploughing season, (say from the 15th November till the 15th of January,)

in order to keep the ploughs in motion. This labor would be considerably diminished under the three-shift plan, for the plain and obvious reason, that a bush or shrub is easily cut off, or taken up, at one or two years old, when if permitted to grow, and increase in number, another twelve-months, the labor would be increased nearly two-fold; and we all know the difference between working a field recently cultivated, and one that has not been disturbed for a longer period of time.

Again the three-shift system offers a great inducement to abandon that *pest* on all stiff high land, called *herds grass;* for on the four-shift system with this grass, we only reap the advantage of the grass the last or fourth year, it being hardly discernable the year after seeding; whilst on the three-shift plan we may avail ourselves of the use of clover, which springs up earlier, and affords a much better covering to the land. The clover crop on good high land, and with seasonable weather, may be used moderately the year it is seeded, and yields one of its best crops the succeeding year—which may be called a "nimble shilling," and according to the old adage,is worth at least a "slow dollar."

Lastly by adopting the three-shift plan, the farmer is enabled to turn his attention more to the subject of manure, which to the vegetable kingdom is of the same importance, and sustains the same relation, that bread does to the animal kingdom. And we are here led to ask what is the best application of manure, or what is the best system of manuring? Shall we apply the little that is made to the poor worn-out spots? or shall we give it to those parts of the field which are in better condition? It surely cannot be sound policy to give one bushel of manure to a gulley which will scarcely compensate us for *the time* required to scatter it on—especially whilst we have so much land of a better grade, that will, on a moderate calculation, pay us double.

I have thought, Mr. Editor, for a long time, that many of us who make great pretensions to the subject of *improvement*, commence at the wrong end of the chapter. What would be the difference of product in applying manure to an acre of exhausted land—and applying the same quantity to an acre in good condition? Suppose a certain small quantity of manure applied to an acre which will produce without that aid, one barrel, and the gain should be one-tenth—would an acre capable of producing *two barrels*, gain only one-tenth? But if each acre gains one-tenth, does it not follow as a consequence, that we have taken the wrong end first? Does manure increase the productive capacity of soil in proportion to the quantity applied; or is it in proportion to the fertility of the soil previous to the application of manure? I do not suppose the productive capacity of soil can be the law regulating the increase, unless by that capacity we mean the fertilizing matter already contained in the soil, which possibly may be the case, and is perhaps exemplified in the application of plaster—for we can scarcely believe the very small portion of plaster generally used, could have the effect so frequently seen, unless we reason on this hypothesis. But as a general rule, I am disposed to think the *increase* from manure, is in proportion to the fertilizing matter already contained in the soil, and a particular adaptation of this manure to the soil. Let us take four lots of land Nos. 1, 2, 3 and 4, differing in point of fertility according to their respective numbers; that is, No. 1, producing one barrel—No. 2, producing two barrels, &c. Now, supposing that the same small quantity of manure is applied to each of these lots, which lot will give the greatest return for the application? The gain of No. 1, taking a tenth for the increased production, is one-half bushel—No. 2, gains one bushel—No. 3, gains one and a half—whilst No. 4, gains two bushels, thus showing an increase of product for the same labor and expense, of 300 per cent. This perhaps would be the result until the soil is brought up to its highest point of productiveness, or nearly so, at which time we might take the next number, and so on, until we shall have completed the rotation.

The policy of this course arises from the simple fact, that under present circumstances, we are put up to all that we can do, to make both ends meet, and the plan proposed provides for the *present* a more plentiful return, whilst for the *future* we may remember the proverb—"Sufficient unto the day is the evil thereof."

Opinions on these matters, from any of the readers of the Farmers' Register are respectfully solicited by a subscriber from

CHARLOTTE COUNTY.

ON SAVING CLOVER SEED.

To the Editor of the Farmers' Register.

Granville, N. C. Aug. 1835.

The following extract of a letter was handed me by a friend, a copy of which I send you for insertion in the Farmers' Register. The cause of agriculture is to some extent interested in the dissemination of information upon the subject of this letter. There exists in this section of country a strong prejudice against the use of clover seed sold by the merchant, from the danger of introducing nettles, and other pestiferous plants—and besides, the cost is in a great many instances, an objection to the buying of them. I hope some one of your readers is in possession of a more convenient and speedy means of saving these seed, than the one described below. If so, he would confer a favor on the public by publishing it through the columns of the Register. I should myself be particularly gratified, by seeing a comparative estimate of the trouble and labor of saving the seed, with the cost of purchasing them.

Extract of a letter from Dunkerque in France, in answer to inquiries respecting the culture and manner of saving clover seed in the north of France, and kingdom of Belgium.

DUNKERQUE, *Jan.* 7, 1834.

"The seed is sown from the month of March till about the 20th of May, in ground sown with wheat or oats. It ought to be sown in cloudy, foggy, or rainy weather, as hot sunny weather is apt prematurely to burn part of the seed, and of course make the crop thin on the ground at harvest.

When the wheat or oats are cut, the ground remains covered with the clover plant, which does not require the least care or trouble during the

winter, unless being passed over by a wooden or iron roller, where the frost has rendered the ground too light. In the month of May of the following year, they pull out all the thistles, and other destructive weeds, and plants that may be likely to impede its growth, or be troublesome afterwards. In the beginning of July they cut the first crop of hay. This first crop does not give any seed, but the plant grows again, and it is in the second cutting or crop that they find the seed. It is for the farmer to judge when the plant is ripe enough to cut for seed. However, it appears necessary it should be quite ripe, or apparently dead. They then dry it well and stack it, and when dried or deadened, they thrash it out with flails, in the same way they formerly used to take out grain in Scotland. It is, however, very difficult to part the seeds from the husks of the clover plants, and then it requires all the skill and ingenuity of the farmers, with their fanners, rakes, sieves, &c. to cleanse it so as to please the English, and more especially the Scotch farmers. This plant is generally sown in land which requires rest, and is followed by a crop of wheat. Thus they will in the year 1833 have wheat in which they sow clover seed in 1834. They gather the harvest of clover seed in 1835—they have wheat again, and in 1836, a crop of flax. This mode of culture generally produces the finest quality of flax, but the land must be good and rich.

"If any further information regarding this or any other of our productions, can be useful to you, or your American friends, you know you have only to say so, and to command my services."

T.

The above you will publish or not, at your discretion, in the Farmers' Register. The subject attracted my notice from its being the first account I have seen of a method of saving clover seed. I hope (more for the benefit of my neighbors and others, than of myself, for I never expect to gather the seed, although I sow it to some extent, and intend to do so quite extensively hereafter,) it will turn out that the ingenuity of some of our Yankee brothers has already invented a machine or a mill, for the purpose. If they have not it seems to me from the nature of the thing, a matter of surprise. The introduction of clover into the county of Granville, is of recent date, and until the last two or three years, its successful cultivation was regarded as an experiment. This experiment has, however, been fairly made, and its success has fully realized the most sanguine expectations, so that the crop is now coming into common, and in some instances, into extensive use; and I doubt not will, with the herds grass and other artificial grasses, in the course of a very few years, greatly improve our system of agriculture. The doubts heretofore entertained with respect to the culture of clover, were formed with reference to the heat of our summer months, and not to the character of our soil, which is generally well adapted to the growth of tobacco and wheat, and of course, in the absence of other opposing influences, to clover.

[There are several objections to mowing clover to save the seed, for the farmer's own use. The stalks and leaves, which, if left, would help to enrich the land where they stood, are taken off, and with much labor, to be carried out again for the same purpose, even if not wasted. A large proportion of the seeds are harvested green, or, if waited for, to ripen, the early ripe will have been mostly wasted. Bad weather, after mowing, will cause much more loss of seed, either by shattering or sprouting. The seeds then must be separated from the stalks by treading or trashing, and fanning, at considerable cost of labor. Finally, all the seeds of bad weeds, ripe about the same time, are saved with the clover seed, and carefully sown over the other best parts of the farm.

There are contrivances to pull off the ripe heads of the clover, by means of an edge formed into long teeth like those of a comb. The smaller kinds are worked by hand—the larger drawn on wheels by a horse. This plan seems to be free from most of the objections stated above, and to promise well in theory. Nevertheless, in 40 years it has not worked its way any where into general use, and very few farmers in Virginia have used, or continue to use this plan.

There is another mode which would seem the most slow and tedious of all—but which we think decidedly preferable both to buying the seed, and to saving them by mowing and thrashing. This is to pull off the heads by hand. When there is plenty of crop to gather, and there is no objection to leaving a large proportion—and even though the growth is irregular or in spots—women, stout boys, and girls, will gather from eight to ten bushels each a day. These are of course only the heads containing ripe and perfect seed—and no seeds of bad weeds are mixed with them. The seed live and thrive better by being sown in the chaff—and the only objection is the great difficulty of regulating the quantity. If equally distributed, six bushels in the chaff are enough for an acre. In this manner every day's work is saved, by putting the seed in a house as fast as gathered. No bad weather causes loss, except by interrupting and preventing the gathering. Where there is the proper kind of labor to spare in August (which however never can be where there is cotton to pick out,) it is seldom so profitably employed as in this seemingly slow way of saving clover seed.]

THE IMPROVED POCKET CHONDROMETER.—SKINLESS OAT.

To the Editor of the Farmers' Register.

This being a very useful little implement, and probably not generally known to your subscribers, I take the liberty to send you a description of it, together with a copy of the printed table pasted on the inside of the small box containing the implement itself. Its use is to ascertain the weight per Winchester bushel, of all kinds of grain or seed, which it does very accurately. The principle on which it is constructed is that of the steelyard. It consists of a very neat little brass standard, six inches high, with a circular bottom about two inches diameter, a small bar about nine inches long, part brass and part steel—the brass part graduated, and having a small brass weight made to slide on it so as to mark by its edge the number of pounds per bushel, of the grain or seed intended to be weighed. For the other end of the bar

there is a little brass bucket made to contain about a gill, struck measure, which is to be carefully filled with whatever you design to weigh, when the bar is fixed on the standard, and the brass weight being moved until it balances the filled bucket, ascertains precisely, the weight by the struck Winchester bushel.

Copy of the accompanying Table.

Seventeen specimens of marketable grain and seed.

Wheat is from	55 to	63 lbs. per bushel; mean wt.	59
Rye,	50	56	53
Barley,	45	49	47
Red clover,	60	64	62
White do.	66	70	68
Dutch clover,	65	71	68
Hemp,	38	42	40
Linseed,	44	50	47
Turnip,	48	50	49
Oats,	35	42	38½
Meadow grass,	10	18	14
Rye do.	12	20	16
Cinque foil,	22	28	25
Peas,	62	67	64½
Small beans,	60	66	63
Canary,	54	56	55
Rape,	47	50	48½

The use of this little implement will be obvious, I think, at first sight; for it furnishes, at once, a more convenient and expeditious mode than any I have known tried, of ascertaining the comparative weight of all our varieties of wheat, corn, rye, and oats; and as their value generally, is in proportion to their weight, it is a matter of some importance, as well as curiosity, for every farmer to possess so easy a means of ascertaining which is the heaviest. I have very often used this instrument, and in several instances, have sold my wheat by it—the purchaser being perfectly satisfied with this mode of determining the weight. By this I find the weight of the skinless oat to be 47 lbs., whereas the heaviest oats in England, (as you will see by the table,) weighs only 42 lbs. As you may never have seen this new variety, which has lately been introduced into England from China, and cultivated with great success, I send you a few grains as a sample. Last spring I purchased from one of William Prince's agents, in our neighborhood, a single quart, at the rate of $16 a bushel! One pint of these I drilled in my garden, nine inches apart, the wide way, and two inches the other, as near as I could prevail on the hands employed to drop the grains at that distance; but they were probably nearer. In this way the pint sowed 247 square yards, and produced 116 pints of such grain as I send you. The produce would have been something more; for three spots, each about six or seven feet square, were lodged, and consequently injured. The average height, when ripe, was about four feet, and the appearance then, by far the most beautiful of any small grain I ever saw. From the looks of the grain I should judge it would make very good flour; but for horse feed it must certainly be vastly superior to any other oat yet discovered. To judge by my single trial, they will make at least as much, by measure, as any of the kinds we cultivate, and will so far exceed them in weight as to give them a very decided preference. Be all this, however, as it may, I have determined to sow as many bushels of them next spring, as I can procure: not however, at sixteen dollars a bushel.

JAMES M. GARNETT.

MOVEMENTS OF THE ABOLITION SOCIETIES; AND ANTICIPATED RESULTS.

For some years past, the small, but growing and active sect of abolitionists in the Northern States, have been bringing their theories respecting slavery into practical operation: and the effects have recently assumed an importance which threatens seriously to affect both the agricultural interests and political rights of the Southern States. This sect, composed of bigoted and reckless zealots, who avow their aim to effect, if possible, the entire and immediate abolition of slavery, at all hazards, and without regard to consequences—has increased rapidly in numbers and strength. Nor is this strange. The detestation of slavery, in the abstract, is a feeling almost inseparable from man's best feelings; and thousands of slave holders—who will, if necessary, defend their rights against the attacks of the abolitionists, at the bayonet's point—would make far greater personal sacrifices, in any feasible and proper manner, to mitigate the evils, or remove, if possible, the existence of slavery, than those who condemn and denounce them. It is the easiest thing in the world to be charitable at the expense of other people—and there never will be a lack of fierce advocates for the removal of this evil, though by producing evils ten times greater, so long as all the losses and dangers from the change, whatever they may be, must fall on those far removed from the zealous and ferocious "philanthropists"—who are striving to put fire to a train of gunpowder, because they are in perfect safety from the awful and destructive explosion that may follow.

These societies, lately deemed so contemptible, and now perhaps as incorrectly elevated to a most imposing station of power and influence, are now using systematic efforts to reach their end. More than 200 affiliated abolition societies in the Northern States, have already been organized, to labor for the good or the ill of the South: large amounts of money have been collected—secret emissaries are employed in the South—from their presses numerous publications are issued, filled with misrepresentations and falsehoods, addressed to the supposed feelings of the slaves, and to the degraded understandings and besotted prejudices of the lower class of their northern countrymen—and these publications, through the mails, are sent free of carriage (to the publishers) to every part of the south, as well as of the north. These violent and open proceedings, and the strong suspicion that even worse are in secret operation, have roused the south, and drawn forth a burst of indignation, and expression of determined resistance, which will be universal. In this matter, at least, there are no party divisions to distract our views, and to prevent a united effort to maintain our interests and rights. Whatever may be the issue, the people of the south will, in defence of their rights and property, act as one man. Public meetings are every where called. They have been already held in Richmond and Petersburg, and with a unanimity with-

out precedent, resolutions have been passed expressive of their feelings of indignation—and of approval of such legal and proper measures, (and perhaps rather exceeding the legal limit,) as may be deemed necessary to guard against these assassin-like attempts. The circumstances of the very recent discovery of an intended insurrection of slaves in Mississippi, instigated, planned, and intended to be led (as is alleged) by white men, some of whom were emissaries of the northern abolitionists, have served to add fuel to the flame, and to increase the bitterness of denunciation, and of hostile feeling.

So far as the opinions of the South, (as proceeding from public meetings, and from the press generally,) are expressive of indignation at the movements of the abolitionists—and of determination to resist, *at all hazards, and to any length*, the practical execution of their theories, (even in the slightest particular,) they command our entire and hearty approbation. But we greatly doubt the propriety and the policy of giving so much importance to the ravings of the abolitionists, and to their circulation through the press and the mails. The violence of effort openly exhibited in endeavoring to suppress these publications (even if entirely successful in the attempt,) may have as ill effects on those for whom these publications were designed, as their circulation: and perhaps we may be thereby increasing the apparent importance of these societies, and possibly their influence and power, far more than their own labors could as yet have effected.

We do not intend to discuss the question of right, or policy of the institution of slavery as it exists in these states. We should disdain maintaining the argument to defend our rights, or to urge our claim of property. Whatever may be the evils of our system of slavery, (and we deny not that they are many for the slaves, and still more for their masters,) the matter is *our own concern*—and we will not consent to its regulation being touched by the people of the north. And while they will confine their efforts to mere *words*, they will meet with no success in exciting the slaves (of Virginia at least) as a body, to insurrection. There would be at least as much prospect of success, if the attempt was made, by writing and printing on this side of the Atlantic, to stimulate the peasantry of Ireland, or even the better informed poor population of England, to cut the throats, and seize the property of the rich. But though the object of the abolitionists is altogether visionary and impracticable—and would be a subject for derision and contempt, but for its probable accompaniment of horrors—still they *can*, and probably *will*, (if at all *countenanced by the better judging majority of their countrymen*,) produce effects of awful importance, and affecting deeply and permanently, the welfare of the people of the United States, and the permanency of their present general government. The utmost direct effect of the efforts of the northern provokers of insurrection, would be conspiracies of slaves, detected before maturity, as recently in Mississippi, and visited awfully, illegally, and without just discrimination, on the heads of black and white—of the innocent as well as the guilty—or partial massacres by the blacks, as in Virginia in 1831, which however atrocious, and afflicting to individuals, would be nothing as a war measure, and would draw down most certain vengeance and destruction on the heads of the murderers. Whether such effects may be great or small, the sure and inevitable result must be, that whatever evils may be brought on the whites, will cause ten times as much to the race which the "philanthropists" are aiming or professing to serve. If any one desired the greatest possible amount of misery to be inflicted on the slaves of the south, by any means, and without regard to other consequences, he ought to wish for the increase of the numbers, strength, and power of the abolitionists of the north.

The Southampton massacre is often brought forward as proof of the impending danger of insurrection. To our understanding of those deplorable events, and the consequences, (and we had good means of knowing them,) they prove directly the contrary. The insurrection of Southampton was gotten up and sustained through its brief course of thirty-six hours, by the concurrence of several circumstances, some of which are so rare, that they never can be again looked for. The leader was a man of uncommon power of mind, yet touched with something of insanity—a religious enthusiast, who had persuaded himself, and some of his ignorant followers, that he possessed prophetic, and perhaps other supernatural gifts. While this delusion (and this alone,) served to gain him his first few followers, he had cunning enough not to impart his design, even generally, but to two, until the day of the out-break—and to but six or seven in all, before committing the first midnight murders on the sleeping and unsuspecting victims. If the secret had been committed to even fifty, and for a single week, there is no doubt but it would have been divulged, as in every other case of conspiracy. A powerful aid, also, to this most successful of insurrectionary movements in this country, was that it was the season for distilling; on every farm new brandy was found in abundance, and its maddening power was kept in full operation to gain recruits, and to stimulate them to acts of butchery. Their whole bloody progress manifested the deeds of men made frantic by the conflict of drunken valor, and the cowardice of their nature, or of education. The band never reached fifty in number, and half the recruits were forced by threats into their ranks, and most of the others were deluded by false statements of their force and success, which were almost equal in power to actual constraint. They murdered fifty-five persons, all surprised and defenceless, and mostly women and children, before their movements were enough known to cause resistance—and as soon as the least effective resistance by armed whites was made, the whole band broke and fled, scattered in dismay, and not the slightest attempt was made to rally, or repeat the effort. All the guilty perished—and unfortunately more than the guilty, from the madness of the times, such as will always be excited by such events—and of which awful fruits will always be produced, when an infuriated people (as lately in Mississippi,) take the execution of law and justice into their own hands—which is equivalent to having both law and justice completely put aside, and their place taken by the ignorance, delusion, and worst passions of men.

The efforts of the mad abolitionists of the north, (or of their more temperate countrymen, who claim to be friends of southern interests, because they are for at-

tacking slavery slowly and gradually,) may cause repetitions of such events, and their equally deplorable consequences: but they will only serve to destroy whatever amount of happiness and contentment is now enjoyed by our slaves, and produce to them misery, if not destruction, without there being a semblance of hope for effecting, by any of their efforts, the object of a peaceable extinction of slavery, and elevation of the condition of the blacks to equality of right and power with the whites.

It would be useless to remonstrate with the abolition societies and their leaders—to address ourselves to the reason of men who insantly expect to reach their objects through the desperate means which they use—or to appeal to the sense of rectitude of any, who, even for a desirable end, would willingly resort to means so abominable—so murderous in their tendency. But we would address our language of complaint and of warning, to the great majority of the citizens of the northern states—who declare themselves friends to the south, and utterly opposed to the schemes of the abolitionists—in the hope of inducing them to exert their counteracting influence, and to put down the nuisance—to use the power which the great body of any community on the right side must always have over a very small portion, considered by that majority as altogether in the wrong. We would ask of the reflecting, to say whether the movements of the abolition societies are likely to effect their avowed object, even if the object is thought desirable—and of the prudent and calculating, to consider whether any results disastrous to the interests of the south, would not also necessarily and greatly injure the interests of the north.

We are assured, from the north, as with one voice, that the abolitionists are but a few, scorned and contemned by the people generally, and by all of worth and high character. Still this despised handful of men, call and hold public meetings to disseminate their doctrines, in every town—have openly established, and keep in operation, presses to flood the south with incendiary publications—and instead of being put down by the force of what is said to be the public and general opinion, are permitted to proceed in their course without impediment of any kind. The reply is ready, that these acts, however detestable, are not in violation of existing laws, and therefore cannot be restrained. It is not for us to point out the remedy—but we beg leave to submit a similar case for illustration.

The people of the southern states are very generally opposed to the policy of forcing manufacturing, or other pursuits of industry, by protecting duties—by the operation of which, it is considered, that they and their country are heavily, unjustly, and illegally burdened, to furnish millions in indirect bounties, to northern capitalists. Very many of us in the south, upon general principles, as well as in regard to our general interests, are as hostile to this policy, as any calm and dispassionate abolitionists can be to the existence of negro slavery. Now suppose that a few thousand of our zealots—(for they are to be found in all parties and sects—) were to carry to such excess their hatred of this iniquitous policy of our government, as openly to league for its destruction, by inflicting loss and destruction on the interests and persons supported and enriched by protecting duties—that they provided materials and employed agents to burn the factories of the north, and to poison the proprietors and superintendents: that under a philanthropic horror of the enormous mass of suffering which is certain soon to reach, and then forever to attend the laboring manufacturers, (far worse than the sufferings of our negro slaves—) that all means of seduction were addressed to this class, including the plunder of their employers' property, to urge their joining in and becoming the most efficient agents of the work of destruction. Suppose that the preparation of means for these ends was carried on without disguise—that proselytes to the hellish design were continually and zealously sought by public meetings, and publications, in many southern towns—that the leaders and principal actors were all known, and even proud of their notoriety—and that nothing was hidden except the operations of their emissaries, attempted or executed in the northern states. Suppose farther, that with all this unlimited malignity of intention, the actual effects produced were comparatively trivial, and that the northern manufacturers, in fact, feared their enemies as little as slave holders have to dread the now avowed abolitionists: still—would such a state of things, and its evident increase, be patiently borne by the north, and the southern states be held as friendly? Would the plea be valid that "these villainous plotters were but a few, held in detestation and contempt by the great body of southern people, who would rejoice no less than their northern brethren, to see such miscreants meet with merited punishment, if the laws were such as to permit any to be inflicted: but that no existing laws had been violated by the known acts of these men in the south—and when they carried their proceedings to the northern states, it would be for the latter to apply the proper punishments—in the propriety of which, (and in aid of which, if necessary,) the south would heartily concur." If such declarations would serve to justify us in the opinions of our northern brethren, we ought to receive as equally entitled to respect the reasons given for the impunity and unmolested progress of the bold and open conspirators and incendiaries of the abolition school.

From the Arcana of Science.

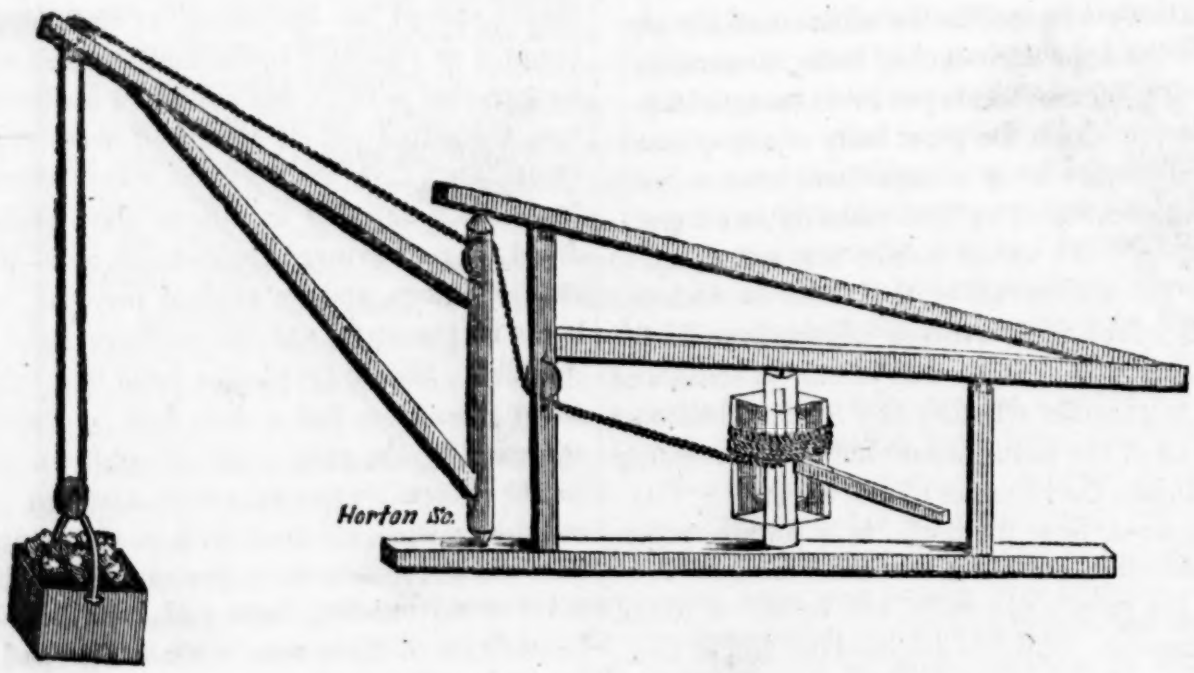
HOUSE FLIES.

On April 7, the Secretary of the Entomological Society read a paper by Mr. Spence, detailing a a curious mode, adopted in Italy, of excluding the house fly from houses. The plan consisted simply in straining a net, made of white thread, across the aperture of an open window: the meshes of the net were about half an inch in diameter. It had occured to Mr. Spence, whether it could be the dread of a spider's net which caused the flies to avoid the thread net, but on consideration he had determined otherwise; and he was totally at a loss how to account for so singular a circumstance.

For the Farmers' Register.

MACHINE FOR RAISING MARL.

In your Essay on Calcareous Manures, you give instructions for digging and carting marl. This method I pursued for several years, but found the labor hard on my hands, and tedious. Marl here is generally found in deep ravines, or in wet grounds. My operations have been slow, from the difficulty of making firm and lasting ways, and the labor of ascending steep hills. Last winter I made a model, and this spring I built a machine for raising marl, to be worked by a horse. I have been using it to advantage, and now send you a draught of it, as it may be useful to those who have wet marl pits like mine. By means of a pump to throw off the water, pits may be worked at a considerable depth; and even if marl is dry, if it lies deep, I think it may be used to advantage. I use two boxes, and by means of hinges and a latch, the marl is discharged from the bottom. I have double blocks: the rope passes through the swoop about eighteen inches from the end, and runs down to the post which supports the swoop, and passes through it, on a small roller, and in like manner through the next post, to the cylinder, to which a reel is attached to increase the motion. The post which holds the swoop and the cylinder, runs on iron pins let into thimbles. The lever is in two pieces, one fastened in the cylinder with a groove at the end, into which the other is let, and secured by a sliding iron clamp. When the marl is discharged from the box, and the swoop swung round over the pit, in nautical phrase, by unshipping the end of the lever, the rope unwinds, and the box descends without moving the horse. The circle in which the horse travels ought to be twenty-one feet in diameter, and the second and third posts supported by side braces.



The cost of the machine is small, though I cannot make an exact estimate. The carpenter who did the work, was hired by the day on the farm, and was taken off with other jobs: but his bill could not exceed eight dollars. The cost of the iron work was ten, and one hundred and sixty-five feet of inch rope, at eighteen and a half cents a pound. The timber, taken from my own woods, may be estimated at five dollars. The rope I find soon wears out, and I intend to supply its place with a light iron chain.

When the marl is uncovered, with one efficient hand in the pit, and a less efficient one to discharge the boxes and drive the horse, five hundred bushels may be raised in a day. The work is not oppressive to the laborers. The teams stand on high, dry ground: no sloughs to plunge through, and no hills to climb. The swoop is turned by a small rope over the carts, and the marl immediately discharged into them. I work four carts, with two sets of oxen to each. They came out of the winter lean and weak; and now with green clover for their food, at the distance of a half to three-quarters of a mile, I draw out from four to five hundred bushels a day; and my oxen have improved. My work goes on with ease and expedition, without stoppage to mend roads, or to clear ditches.

WILLIAM CARMICHAEL.

Wye, Queen Anne's co. Md. July 15, 1835.

CULTIVATION OF BEET-ROOT SUGAR IN FRANCE.

A hectare of land (nearly 2½ acres) sown with beet, produces, in most cases, 2,400 kilogrammes of the root, which is equivalent to 47 cwt. 36 lbs. avoirdupois; and there are many instances in which a single grower raises from 80,000 to 90,000 kilogrammes (6,260 to 7,098 cwt.) The cultivation costs the farmer about 8s. the 1,000 kilogrammes (20 cwt.) The quantity of sugar extracted by the present process is in the proportion of seven or eight parts of saccharine matter out of 100 parts of the raw root. From the molasses, sugar is obtained, and the pulp furnishes nearly as much fattening food for cattle as the root in its simple state; the leaves also are much sought after by the grazier for his cows during those months of the year when green fodder is not easily obtained.—*Printing Machine, No.* 24.

From the Silk Culturist.

CLIMATE AND SOIL OF NEW ENGLAND.

Almost every newspaper in the country has an occasional paragraph on the culture of silk, and in many of them we notice the elimate and soil of New England, spoken of as admirably adapted to rearing the silk worm and the cultivation of the mulberry. Remarks of this kind have a tendeney, not only to make an erroneous impression but to mislead other sections of the country into a belief that there is something peculiar in our climate and soil, which gives us advantages and facilities, in this respect, not enjoyed by others, while, at the same time, precisely the reverse is true. That providence in the distribution of its gifts has given us a climate and soil congenial to the production of silk is a matter of fact, and ought to be of gratitude and thanksgiving; but that it has lavished them upon us in greater, or even equal profusion with some of our sister states is not true.

The middle, southern, and western states, have natural advantages for the culture of silk, which the northern can never enjoy. The white mulberry will grow luxuriantly in all parts of the United States, and so far as its foliage is depended upon for the subsistence of the worm, the natural advantages of all the states are equal. But with respect to the Chinese mulberry, it cannot be cultivated in the northern states, without much additional labor and expense; while at the south no extra care or precaution is indispensable to its propagation. This gives the southern section a decided advantage over the northern, which no amount of skill or experience, can counterbalance. The whole truth about it is, a portion of the population of New England, and especially of Connecticut, have been for about half a century engaged in the culture of silk, and their experience and observations have constituted a fund of practical information on the subject, which cannot be found in any other part of the country. The success of the silk business in Connecticut, is therefore attributable to this cause, and not to any peculiar adaptation of climate and soil, for in this respect we are far less favored than most of the other states.

From the New York Times.

CULTIVATION OF SILK.

It is little more than fifty years ago, since an American vessel was seized at Liverpool for having on board eight bales of cotton, it not being believed that the article could be produced in this country. At present about 600,000 bales are carried to the same port. To the culture of this article the country owes a great part of its wealth and prosperity. Where fifty years ago eight bales of cotton were produced, one million two hundred thousand are now produced. If fifty years ago a man had ventured to predict that the article of cotton would become the grand staple of the country, and add millions upon millions to its wealth, he would have been laughed at as a madman. It has lately been predicted that before many years are passed, the production of silk in this country will equal the production of cotton; and we see no reason to question the justice of the calculation. The cultivation of this article has been commenced by the enterprising men of the east. The soil and climate of New England are admirably adapted to its cultivation. Those who have thus far engaged in it, have reaped good profits, and have every reason to persevere. It has commenced in a part of the country where thrift and industry have never failed to succeed. It has been commenced under far more favorable circumstances than those which attended the first cultivation of cotton. It requires but little labor, and the principal part of the labor required may be performed by females and children. The experiment has thus far proved successful, and it has been attended with but a trifling degree of expense.

A MODE OF DESTROYING ANTS.

A writer by the name of Roughly, says: "Poisoning with arsenic is the most expedient mode of getting rid of ants, as the living will feed on the dead, so that the whole nest, (by devouring one another) are thus killed."

From the Northampton Courier.

PLOUGHING UNDER GREEN CROPS FOR MANURE.

Being the owner of a small farm, most of which was in a low state of cultivation at the time I commenced making experiments, and feeling desirous of enriching it faster than I could with stable and barn yard manure, the quantity made being small I therefore resolved to try the effect of ploughing under green crops. The piece upon whch I tried my experiment contains nearly four acres, and is of a hazle-nut colored loam, lying near the Connecticut river.

In 1831, the lot above mentioned had wheat and rye reaped from it; about $1\frac{3}{4}$ were of wheat, and produced 17 bushels, yielding $9\frac{5}{7}$ bushels to the acre. The $2\frac{1}{4}$ acres of rye yielded about 27 bushels being 12 bushels to the acre—total of wheat and rye, 44 bushels. The ground for the wheat was ploughed three times and had the same number of harrowings. That for rye was ploughed but twice, with two harrowings; clover and herdsgrass were sown on the whole piece. At the time of raising the grain, I did not intend trying any experiment; but the grass seed not having come up well, the lot was ploughed once in August, 1832, and sown with rye, was fed down with sheep in the fall and also in the spring, until about May; thus affording sufficient feed to pay the expense of the seed for the first crop.

After the sheep were taken from the grain, it was left to grow until about the time it blossomed, when it was ploughed under, and the ground sown with buckwheat—$\frac{1}{2}$ bushel of seed to the acre. When the buckwheat was in blossom, that was also ploughed under; after which the ground was suffered to remain until a short time before it was sown, when it was again ploughed once, sown with wheat and rye, October 3d. Previous to sowing the wheat, the seed was soaked about twenty-four hours in brine, and afterwards rolled in plaster, where it remained in a body twelve or sixteen hours. My object in treating it in this manner was to prevent smut, and the ravages of the Hessian fly, which has several times destroyed some of my wheat; but fortunately the crops the present

year were uninjured by them. The rye was sown in its natural state.

In the spring of 1834 the whole piece was plastered with about two bushels to the acre. It was sown for the purpose of benefiting the young grass, and it has now (spring of 1835) come up well, and bids fair to produce nearly twice the quantity of feed usually obtained from it in a season. The quantity of grain which the piece produced the past season is as follows: About one acre was sown with white flint wheat and yielded 16 bushels—$2\frac{3}{8}$ acres were sowed with red bearded wheat, and produced 33 bushels, making in all 49 bushels or $14\frac{1}{2}$ to the acre—$\frac{5}{8}$ of an acre was sown with rye and yielded about twelve bushels, being at the rate of $19\frac{1}{5}$ bushels to the acre. The increase of the wheat crop, according to the above estimate, was more than 49 per cent. and that of the rye more than 59 per cent. Had the past season been favorable for wheat crops, I doubt not that I should have obtained eight or ten bushels more. Perhaps some may think the plaster caused the last crop to be better than the preceding one; but I do not think it was, as I sowed some on a piece of rye the past season, a part of which was left unplastered, and it could not be discovered that the plaster benefited either rye or land—the soil was the same as that on which the wheat was sown.

From the [British] Quarterly Journal of Agriculture.

IMPORTATION OF THE BONES OF CETACEOUS ANIMALS FROM THE POLAR SEAS FOR THE PURPOSES OF MANURE.

The great consumption of bones occasioned by the increasing demand for bone-manure in the extension of turnip husbandry to the more remote and inaccessible parts of the country, accompanied with the small indeed, but gradual, rise in the price of that valuable means of fertilizing the soil situate at a distance from large towns, naturally creates the apprehension that at no distant period the demand will outrun the supply. In order to anticipate such an "untoward event," our thoughts have lately been turned to a prolific source of supply which has hitherto been almost entirely overlooked—we mean the Polar Seas. Much valuable bone might be brought home in the whale ships from those regions. One large whale might afford several tons of bones. We are quite aware that while the prospect of an abundant supply of blubber arrests the attention of the whale-fisher, he will be regardless of the bones of the animal. This state of the mind is natural. The fisherman, when so actuated, only fulfils the principal object of his voyage, and were he always certain of loading his ship with the most valuable part of the cetaceous animals which he captures, no one should be so unreasonable as to request him to direct his attention in the short time he has to accomplish his object to any other subject. But we all know how very seldom whalers bring home bumper ships, how much more frequently the ships are only half loaded; while every year some come home clean. Now some of their time might be profitably, at least usefully, employed in securing a quantity of the bones, such as the jaws, ribs, and vertebræ of the animals which they capture, and although it would not be desirable to occupy the most convenient parts of the ship with bones, while there was a prospect of obtaining blubber, it should be remembered that no bones can be obtained without in the first place securing the blubber. It will, no doubt, not unfrequently happen that the most successful periods of the fishing, are those when the capture of whales takes place faster than the blubber can be removed from the carcass and stored by; and we have heard a whaler assert that they have had fourteen carcasses floating alongside awaiting the process of fleecing. But if the whole bodies can be kept floating alongside to await the convenience of the crew to remove the blubber, cannot the fleeced bodies in like manner be kept floating till it is convenient to disengage some of the bones? Bones are easily disengaged, and would be of easy stowage. They could be cut into junks with cross-cut staws made for the purpose, and many of them used as wedges to secure the butts in the hold, while others could be stowed away in any space in which a butt cannot be stowed. In this manner any ship could bring home many tons of bones; and it might be an understanding among the masters of the ships on the fishing ground, that if one ship was much taken up with the storing of blubber, while another was less successful, the latter might get leave to tow away the fleeced carcasses to their own ship. We have heard it stated that the bringing home of bones would be a question of freight with the owners of the ships. We think this is a mistake, for the mode in which whale-fishers are paid has no reference to freight. They are paid according to the tons of blubber which they bring home. Some bones have been brought home of late years; one ship from Leith last season we saw brought four or five tons; but what is that trifling quantity compared to what she might have brought when she came home little more than half laden? The mode adopted by the owners for paying for bones, is to give the crew one-fourth of their value, so that the question of freight has nothing to do with the matter. We wish the owners of the whale ships from Scotland would seriously take this matter into consideration, and encourage their crews to stow as much bone as they conveniently can at their leisure. The value realized by the bone might not only pay the expenses of delivering the ship, but might even reimburse the owners for the loss of the bounty, over and above the value of the blubber in an average voyage. If a premium of a piece of plate from the Highland Society would be any stimulus to the captains who would bring home the greatest quantity of bones, and thus forward our views for the benefit of agriculture by a constant supply of a cheap and efficient manure, we are sure they will be happy to grant such a prize to the successful competitor, and the owners we are assured would be proud that it was one of their ships which had carried off the honored prize.

From the British Farmer's Magazine.

REMARKS ON THE SCARLET TREFOIL.

Addressed to the Conductor of the Gardener's Magazine, and communicated by Mr. Loudon.

As the scarlet trefoil (*trifolium incarnatum*) has already engaged the attention of agriculturists, and from its valuable properties is likely to be brought into general use, permit me through the

medium of your periodical, to offer a few observations on the best mode of cultivating it.

It is well known, that all the clovers like a solid bottom; and from experience it appears that such is more particularly the case with the scarlet trefoil. When the land upon which it has been sown has been rendered fine and light, by repeated ploughings, the crop has frequently been an entire failure. Such failures have been attributed to the depredations of grubs; but there is much reason to believe that, the plant perished in the winter, owing to the lightness of the soil, as I have never heard of a single instance of failure when the seed was committed to an unploughed surface. In the beginning of October, 1833, I sowed a plot of garden ground, the soil being strong and rich, upon a chalk bottom. The seedlings came up well; but, in the course of the winter, all perished, with the exception of a single plant. In September, of the same year; Colonel Beach sowed a few acres in a field, about a hundred yards distant, which he had ploughed and dressed for the purpose, the soil in this case being of a similar nature to that mentioned above, and here again the crop was a failure. At a distance of about two hundred yards, and upon soil precisely similar, and in the same season, a stiff, unploughed wheat subble produced as fine a crop as could be desired. The farmer, who had this crop, had previously pursued the same plan, and had realized from his produce upwards of £40 per acre! I find, also, that the crops have frequently failed in the county of Essex, where the ground had been ploughed before sowing. In September last, I sowed four and a half acres upon a barley stubble, without any preparation whatever, and there is an abundant plant. I do not mean to assert positively that, no crop will follow after ploughing; but experience proves that success is very doubtful when this is done.

With respect to the properties of the trefoil, I do not believe that there is a more hearty green food in existence. Cattle are extremely fond of it. Farm horses, during their spring work, may be kept in the highest condition upon it, and after affording abundant feed, may be cleared off in time for turnips or barley, both of which, upon trial, have succeeded perfectly well after trefoil.

Should these observations prevent disappointment, or be the means of drawing the attention of the farming interests to the facts of the case, it will be satisfactory to their friend,

MATTHEW HARRISON.

Church Oakley,
Near Basingstoke, November, 1834.

P. S.—Scarifying the ground has been found to answer well; and where the surface is foul, it is certainly advantageous.

From the Claremont, N. H. Eagle.

SHEEP.

It is a well known fact, that wool growers in this section of the country, whose flocks exceed 200 sheep, lose a large number of their sheep each winter. Some of them, we will allow, die of old age; but too many of them do not live more than two years. There is a remedy for this loss of property and that too directly in the hands of the shepherd. This being the case I am anxious to lay it before the public that all may profit by it hereafter.

It is a custom among many farmers, when they drive in their flocks in the fall, to put the whole flock together in a single barn, shed, or whatever place they may happen to have to keep them in. Now it is very evident that the young, the very old, and weakly, or in other words, the most unhealthy of the flock, cannot possibly fare equally well with the rugged, and it is a fact while the one is thriving the other is losing its strength. When kept in this situation, one after another falls from hunger, and other causes incident to this state of affairs, and they are no longer able to raise themselves. Here the shepherd for the first time separates the almost lifeless sheep from the multitude, and endeavors to restore it to health. But it is too late. He is soon convinced that "a stitch in time saves nine"—that ten thousand dying sheep, are worth no more than the wool on their backs.

When sheep are brought in from the pastures, in the fall, they should be divided into four distinct flocks, viz.

1st. Meagre or sickly—which should be kept in a warm barn, with but few in a pen. They should have salt as often as once a week—should have a handful of corn each day through the winter—as much hay as they can eat through the day, and should be watered as often as twice a day. This will not fail to keep them in good order.

2d. The ewes also should be kept from the rest of the flock and should receive the same treatment with the exception of the green which may be given occasionally, though it is not necessary.

3d. The bucks, intended for the benefit of the flocks, should be kept by themselves, that they may be in good order, and for another reason that will suggest itself to all wool growers.

4th. And last of all are the wethers which may be, if healthy, kept entirely on hay and water.

I have for twelve years kept a large flock of sheep, and have lost a great many; but since 1830 I have adopted this course and have not lost one-tenth as many as I did in the same number of years preceding that time.

AN OLD FARMER.

From the Annales des Arts et Manufactures.

DURABLE WHITEWASH.

I am enabled to certify the efficacy of marine salt in fixing whitewash made of lime. In the year 1795, when I was director of the naval artillery at the port of Toulon, I was commissioned to ascertain the utility of a method proposed by the master painter of that port, M. Maquilan, for whitewashing the ships between deck, and likewise their holds, in a durable manner, by means of lime. Our report was in favor of this process, which consists in saturating water in which the lime is slacked with muriate of soda, (common salt.) The whitewash produced by it is very permanent, does not crack, nor come off upon one's hands or clothes. The experiment was made only on wood. It appears from M. St. Bernarde's account, that it succeeded equally well on walls.

THE PITCHER PLANT.

Few plants if we consider the structure of its foliage, are more interesting than the pitcher plant, of Southern India. It is found in Ceylon, Java, and other islands in the Indian Archipelago. It has been transplanted into several gardens in England, where it attains to great perfection. Its stem is eighteen or twenty feet. It branches out over the wires prepared to support it; and bears numerous leaves, in the form of a pitcher, and which look more like art than the production of nature. The leaf, including the stalk, is two feet long. The pitcher is rather an appendage to the leaf, than the leaf itself. It is hollowed out like an elongated pitcher; and is eight or nine inches long. It is attenuated at its base, where it is curved or arched, and then suddenly turns upwards. In its young state, it is covered by a lid or operculum. After a time, the lip opens, and the mouth of the pitcher is exposed to view. The color is pale green, but often tinged or spotted with red and purple.

From the Field Naturalist.

THE LLAMA OF PERU.

We are indebted to the attention of a correspondent in Oban for the following account of the interesting attempt now making in that neighborhood to domesticate the llama.

I am not surprised that the llamas here should be exciting attention, for they certainly are objects worthy of notice. This animal does not in any shape resemble the sheep of this country; its height is from four to five feet, with long legs and long neck, in some respects not unlike the camel, a small head without horns, the countenance gentle and expressive of wonder. It is not remarkable for any peculiar habits, except that it delights in ascending to the summits of the hills: its appearance indicates an unfitness for climbing: I observe, however, nature has served it with a hooked claw on each hoof, which enables it in some measure to travel heights with as much security as the goat. Their food and treatment differ in no particular from Mr. Stevenson's cows; they graze, eat hay, chopped straw and potatoes, with them daily, and have formed such an attachment to the cows, that when the latter are brought from the hill for the purpose of milking, the llamas will not remain behind, but accompany them to and from the byre three times a day, a distance of half a mile—the wool is extremely fine, each fleece weighing from five to six pounds. Mr. Stevenson imported the first pair (of the Alpacha breed, for there are several varieties,) about three years ago—he tells me that there were four or five pairs shipped for him, but all died during the voyage except the one, and the following year he received another pair of what he terms the real llama, but a common observer cannot descern any difference. They inhabit the mountains of the Andes, and, when domesticated, are used in that country as beasts of burden, chiefly in carrying ore from the mines of Peru, and they carry about 100 lbs., and if one pound be added more than they can carry with freedom, like the camel, nothing will impel them forward. If there was any chance of rearing them, they would doubtless become a benefit to the country, but I fear the hope of their breeding is very uncertain.

From the Arcana of Science.

SOLVENT OF INDIAN RUBBER.

There is no solvent of Indian rubber so good for gardening and most other purposes, as refined coal tar, sold under the name by drug merchants, which is only common coal tar deprived of water by boiling.

From the Southern Agriculturist.

ON THE PREPARATION OF VEGETABLE OILS.

The production of the fixed vegetable oils, has in all climates been a source of wealth; and of course has attracted the science, industry, and capital of cultivators. The plants in use are confined to no zone, though growing in greater variety and abundance, in tropical or hot countries.

We, too, have indulged in speculating upon the agricultural value to us, of oil plants. These speculations have been generally discursive, or directed to some individual of the class. The only methodical investigation of oil-bearing plants, known here or easily introduced, of which we have ever been informed, was undertaken by the late Mr. George Trescot, in whose education, the exact sciences preponderated so much, as to impress us with the belief, that his inquiries would be valuable for their order and precision, he had, as we learnt, in conversation, made considerable progress in his researches, but his untimely death, it is presumed, left them imperfect.

In the east, the plants cultivated for this use, are mustard, the fixed oil of which is as mild and bland, as the volatile oil is notoriously acrid; linseed, familiarly known every where. Sesamum and Palma Christi. This last has been successfully cultivated in all parts of South Carolina, the oil commanding a higher price in the market than any imported. The mode of extraction was generally by boiling. It has fallen into disuse, unable to compete with the profits of our cotton culture, and perhaps, in some degree, from the difficulty of the harvest: the seeds ripen successively, and are shed by the plant as they mature, the loss in this way bears heavily upon the whole crop. It is cultivated like Indian corn, but we are without any circumstantial estimate of the expense and profit of growing it. Many gentlemen resident near Beaufort could supply this estimate, and we hope to draw the attention of their agricultural associations to it.

The sun-flower seed is used in a limited degree in Europe, from the Spanish peninsula to Russia, and its cultivation has been earnestly recommended in the United States, where, in some instances, it has produced 60 or 70 bushels to the acre, the bushel yields three quarts of cold and one of hot pressed oil. Notwithstanding the plausibility of this account, we know of its growth only to feed poultry, and especially turkeys, which thrive upon the leaves and seeds, and, perhaps, it is used quite as much for the pleasure of its flaunting flowers, as for any profit which it brings.

At Arras, and other places in France, extensive tracts are covered with poppies, which adorn hill and dale with their rich variety of bloom. These

are intended to produce seed only, and large mills are erected to crush and press the oil from the seed. When first pressed the oil is colorless and insipid, and the avowed object is to adulterate with it, the more costly olive oil. The same cultivation prevails in Flanders.

All plants producing oil exhaust the fertility of countries in which they are extensively grown, and in fact, they will grow thriftily only in the richest soils. At the mention of exhausting plants, the memory of every reader promptly recalls the cotton, now about to derive from its seed a new recommendation.

A mill for preparing the cotton-seed oil, was erected at Petersburg, in Virginia, several years ago, by Follet & Smith, patentees of that part of the apparatus intended to hull the seed. This process was considered indispensable, and the owners of the patent-right set upon it so high a value, as to deter from the general adoption of it. A small establishment on their plan was made in North Carolina, and General D. R. Williams, of Society Hill, in South Carolina, is believed to have erected a mill after Mr. Smith's plans: we should be glad to hear the results from our friends in that quarter. In order to bring their mill into prominent notice, Messrs. Follet & Smith obtained from our legislature an act of incorporation for a Joint Stock Company, to hull cotton-seed and press oil, but the project has not excited attention, and seems likely to rest in the hands of the patentees.

Launcelot Johnson, of Georgia, invented an instrument for hulling cotton-seed, which he describes as a truncated cone, furnished with teeth, which revolves in a tub adapted to its form, and also furnished with teeth; the two sets of teeth pass near each other and tear off the hull, this is separated by a sieve and fan from the kernels, and the kernels are pressed. One thousand pounds of upland cotton will produce twenty-five bushels of seed; three bushels of seed produce one of kernels, and one of kernels produce two gallons of oil, or one and a half to two bushels of seed, will produce one gallon of oil. This contrivance has not been patented, but on the contrary, the most liberal offers of its use extended through the public prints, with the earnest recommendations of the Hon. Mr. Clayton of Georgia. It has the appearance of a cheap, easily managed, but imperfect engine, and other means supposed to be more efficacious have been adopted.

Individuals in New York are known to use methods of expressing and purifying cotton-seed oil. And the Messrs. Freemans, of Philadelphia, extract the oil without hulling, and clarify it very perfectly; their methods are, we believe, secrets of trade.

Messrs. Plummer & Miller erected in 1833, a very extensive mill at Natchez, moved by a powerful steam engine, and brought to this enterprise all that capital and organized labor can provide for its perfection, their mill has been in profitable operation ever since, and they have secured the most perfect means of purifying their oil. We learn from a traveller, that they have been joined by James H. Couper, Esq. of the Alatamaha, and to those associates, an act of incorporation was granted during the last year, for half a million capital, the establishment at Natchez, being rated at $100,000 in stock. Steamboats ply up the Mississippi, and its tributaries for the collection of seed, the rank fertility of the soil makes this of no value as manure; and it is obtained in part, at least, for the labor of its removal. Branches of the Natches' mill, have been and will be extended through that country.

Mr. John Couper, jun. of Georgia, is the proprietor of a mill of considerable extent at Mobile. His oil when purified by processes, lately introduced, sells there at 90 to 120 cents a gallon.

Cotton-seed oil is consumed, *in painting;* in this use, its character is that of an oil drying very slowly—more slowly than linseed-oil, and unless purified, darker in color; in *burning*, in this, it produces no effluvia and little smoke; in *manufacturing woollen cloths*, in this, its value seems yet uncertain, indeed, very doubtful. For *machinery*, where we should suspect it of too great a tendency to become inspissated, though they say not; and in *adulterating* castor oil, for which it is recommended as a mild substitute.

The meal or oil cake has great value in feeding stock, even hogs partaking of it without injury, the removal of part of the oil, and perhaps, the hull render it more digestible than before. Negroes employed about the mills frequently mix it with their corn-meal as a savoury ingredient; and we have been assured by an eye witness, that it is a decided improvement.

It does seem strange that this state should be the most tardy in turning to account a very valuable product. At length, however, if we are not misinformed, one of our skilful and wealthy planters, is about to embark in the business of pressing and purifying cotton-seed oil here at home.

We solicit from our distant readers intelligence upon this subject.

CONDUCTOR.

From the Arcana of Science and Art, for 1835.

AFFECTION AND VAST NUMBER OF FISHES.

* * * * *

But affection is scarcely to be looked for where the offspring is so very numerous as to put all attempts at even recognising them out of the question. How could the fondest mother love 100,000 little ones at once? Yet this number is far exceeded by some of the matrons of the deep. Petit found 300,000 in a single carp; Leuwenhoeck, 9,000,000 in a single cod; Mr. Harmer found, in a sole, 100,000; in a tench, 300,000; in a mackerel, 500,000; and in a flounder, 1,357,000. M. Rousseau disburthened a pike of 160,000, and a sturgeon of 1,567,000; while from one of this latter class, some other person (whose name we do not immediately recollect,) got 119 pounds weight of eggs, which, at the rate of seven to a grain, would give a total amount of 7,653,200 eggs! If all these came to maturity, the world would be, in a short time, nothing but fish; means, however, amply sufficient to keep down this unwelcome superabundance, have been provided. Fish themselves, men, birds, other marine animals, to say nothing of the dispersions produced by storms and currents, the destruction consequent on their being thrown on the beech and left there to dry up, all combine to diminish this excessive supply over demand. Yet, on the other hand (so wonderfully are all the contrivances of nature harmonized and balanced,)

one of these apparent modes of destruction becomes an actual means of extending the species. The eggs of the pike, the barbel, and many other fish, says M. Virey, are rendered indigestible by an acrid oil which they contain, and in consequence of which they are passed in the same condition as they were swallowed, the result of which is, that being taken in by ducks, grebes, or other water fowl, they are thus transported to situations, such as inland lakes, which, otherwise, they could never have attained; and in this way only can we account for the fact, now well ascertained, that several lakes in the Alps, formed by the thawing of the glaciers, are now abundantly stocked with excellent fish.

A METHOD FOR THE DESTRUCTION OF THE CUT WORM.

To the Editor of the Farmers' Register.

Ben Lomond, Aug. 3, 1835.

It is doubtless a subject of interest to the farmer to be informed on any subject relating to his advantage; and as your periodical has for its object the improvement of agriculture in all its branches, I willingly contribute my *quota*, hoping that what I may say, may serve in a measure to aid that object.

There was a field brought into cultivation this spring which had not been cultivated for several years. The crop planted was corn. The corn sprang up, and had begun to grow "pretty considerably," when on examination a few days after, it was discovered that most of the corn was entirely destroyed by the cut worm. Corn was again planted, and still the same case continued, until in that field the corn was (I may say) planted entirely three times. By accident, however, a small portion of the grass had been burnt—and on examination it was observed that a very small portion of the crop required "*re-planting*," (as the farmers say,) from that cause, viz: cut worm. In this case the cut worm was destroyed, doubtless by the fire, as it was destructive to all parts of the field, except the part burnt. Then, if you should be troubled, or rather expect trouble from the cut worm, if you will burn the grass on your lands, I think I can safely guarantee to you, that the destruction of the worm will be sure.

If any of your readers are willing to profit from the experience of others, let them when necessity requires, try the remedy, and effect the cure.

F. B. WATKINS.

SCARLET TREFOIL. SPECULATIONS ON THE PECULIAR BENEFITS TO WHEAT OF A PRECEDING CROP OF CLOVER.

[The following extract is from a late English pamphlet entitled *Further observations on the cultivation of Scarlet Trefoil, &c.* The facts stated are interesting and important—and though the reasoning is far from satisfactory, it may furnish subject for thought and more successful deductions, on an important and mysterious breach of husbandry, viz. the growth of wheat after clover, and the peculiar benefits furnished by the latter as a preceding crop.]

Now turn to the scarlet trefoil;—whether cut green for the horses or cut for stover, it may be clear from the land the first or second week in June; then the first time the plough goes into the earth it turns up like the finest garden mould, it is like ploughing an ash heap, or diving into a barrel of flour. In the same field, one part of the land is all powder, with only one ploughing, before the harrows have even touched it: and by or before the first of August it will be in a better state than the fallow, where the farmer has been rending and tearing to pieces his implements of husbandry, and wearing his horses to skeletons. The benefit will not end here, for where the scarlet trefoil has grown, the succession crops will be better than on the fallow; I have invariably seen it.

It is impossible to know and contemplate these circumstances without being led into further reflections upon them; in hinting at causes that may produce these effects, it is solely done to ask for information, trusting that this pamphlet may stray into the hands of the scientific, as well as the agriculturist.

When we consider the living wonders contained in a drop of water, which the microscope has lately brought to view, have we not reason to suppose that a grain of earth may be equally teeming with animal life; and when sheltered and protected from the sun's scorching rays by the scarlet trefoil, may they not have produced the effects I have mentioned, and which absolutely hold up the boasted arts and labor of man to derision?

It is well known to every farmer, that when he has a field of clover, part of which shall be a perfect full plant, and part without a leaf upon it, and this last shall be kept free from weeds the whole summer, the other part mown twice, and all the produce carried off the land and nothing returned, yet where this land has been thus robbed without rest or manure, the farmer well knows that the following year this very land will produce him from seven to eight sacks of wheat per acre, and the part that has had perfect rest will not produce three.* Ask a farmer the cause of this, and he will tell you because the earth has been exhausted by the sun: ask, exhausted of what? and after being posed for a time, he will say—moisture: the farmer may be right; I think exhausted of animal life. The farmer well knows if this land is broken up by the plough—the harrows and rolls set to work upon until it is reduced to powder, the moisture will be still further exhausted, yet it will be equally fertile with the other for his crops in due season.

Have not agents, unseen, been doing this work beneath the shelter of the clover, which the farmer knows he must do with his ploughs and teams, to make his land productive? I could mention numerous other circumstances which appear to point the same way.

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* The first part of this sentence is either written or printed very incorrectly, but the intended meaning is easily gathered from the remainder of the passage. The author evidently designed to compare the results of wheat on clover lay (though after mowing,) which in this country is called "fallow," with the very different preparation for wheat called "fallow" in England.—Ed. Far. Reg.

There is a phenomenon frequently occurring in our fine autumnal days, which creates a moment of pleasure and surprise to the traveller. In less than two hours after the plough has turned up the furrows of a field, it will be completely covered, as if a sheet of gauze or lawn had been cast over; this is known to be the work of countless millions of a small species of spider, which are never seen till the plough turns them up to the light. We cannot believe that the Almighty Creator of the universe can have formed these little artizans, solely that the mind of man may receive a moment's pleasure from viewing their floating gossamer.

The information I seek comes, as a question, into a small compass: To what extent animal life exists in the earth, and how far vegetation depends upon it?

From the Southern Agriculturist.

THE FIG, *(Ficus Carica.)*

A native of Caria, in Asia, whence its name; known in the warm climates of Europe and Asia; in its wild state bearing fruit; perfect in the developement of the parts of fructification, but without flavor; those in which the stamens are most conspicuous are apt to fall before maturity, and are used to impregnate and accelerate the ripening of cultivated figs. The practice is said to prevail under the name of caprification, and has given rise to the controversies among travellers in the Levant. The only inaccuracy fairly chargeable upon those who assert the existence of the custom, is perhaps, an affected exactness in the details described; and some extravagance in the results attributed to it. The practice occupied more attention than its importance would seem to have warranted, and has now become a mere matter of curiosity.

Other modes of forcing the fruit to maturity are said to have consisted in punching the fruit at the flower end, or inserting in that end a drop of oil.

This use of oil has been made familiar to us by experiments at home; in our 4th volume, page 224, the use of olive oil or hog's lard in Florida, is described as ripening green and hard figs in seven or eight days, several weeks in anticipation of the regular period of maturity. At page 388, several members of our Horticultural Society concur in stating that applied to the flower ends of fruit from 1 to $1\frac{1}{2}$ inches in diameter, ripens them fourteen days earlier; that oiling the whole fig was injurious; and that the use of oil to those less than one inch in diameter, caused them to fall off, without coming to maturity. At page 473, a drop of oil was applied to the centre of the flower end of the fruit, in less than 24 hours the fruit began to swell and matured a fortnight earlier than those without oil. At page 534, there is reason to believe that the limit to a beneficial use of oil, is in anticipating by seven or eight days the usual time of ripening. The fruit touched at an earlier growth either fell off or was insipid, olive oil or sunflower oil were found effective, tallow and lard ineffective; the trial was extended to both black and lemon figs. At page 582, its mode of operation is discussed, which seems to be by arresting the growth of the part touched, and giving to other portions of the fruit extraordinary stimulus.

We delight in this fruit, and remind our friends of the results recorded as an introduction to what we now propose.

Although one or two doubtful cases have been mentioned to us of the growth of seedling trees here, we think ourselves safe in saving, that no other mode of propagation is known to us, but by cuttings, layers, or suckers.

Many varieties are cultivated here, and of each variety, there are great differences observable in the quality of fruit from individual trees. We propose that every person possessed of a peculiarly fine tree, should take note of its production, and enable us to record a description of the tree and its locality, with a view to the extension of its culture.

The storm of 1822 blew down a tree so large, that it could not be replaced without cutting off its branches; these were trimmed very short, and the tree erected, put forth a vigorous growth of wood. The next year the fruit was so much larger and richer in flavor, as to induce this resolution, of three trees, to cut one close each year, and thus secure a constant supply of fruit from young wood upon large stems; the suggestion is thrown out with the hope of provoking trials to be communicated to us hereafter. The three following sorts are not known to us, and if they exist here, we should be glad to hear of them.

Large white Genoa, fruit large, pale yellow without, red within.

Brown Turkey, large, reddish brown.

Black Genoa fig, fruit purple, almost black, large at the flower end, becoming slender at the stalk, downy and colored like a rich plum.

In the garden of Mrs. Wagner, St. Philip's-street, there existed last year, a very fine tree, suspected to be a brown turkey fig, we hope to hear that it escaped the frost, and recommend it to our readers.

Our people are not sensible of the value of this luxury, or of our peculiar advantages in its cultivation. The following passage will enable them to compare the ease with which we produce this salutary and abundant fruit, with the pains taking of French gardeners.

"The inhabitants of Argenteuil, near Paris, derive their chief support from the culture of fig trees; near that town are immense fields covered with these trees, on the sides of hills facing the south, and in other places sheltered from the north, and the north-west winds.

"In the autumn, the earth about the roots of these trees is stirred and dug; as soon as the frosts commence, the gardeners bend down the branches, and bury them under six inches of mould, which is sufficient to preserve them from being frozen.

"The branches must be entirely stript of their leaves before this is done; the gardener then taking hold of the top of each branch, bends it down gradually, and with much care, to prevent its breaking, placing his knee or hand under such parts as resists the most; the branches that will not bend low enough to be buried, are cut off close to the ground.

A fig tree will remain buried in this manner seventy-five or eighty days without harm; when the season is mild, the gardeners uncover them, especially in times of warm rains, but on the first symptoms of frost they are again buried. Severe frosts sometimes reach them, but the branches

only are destroyed. The roots produce a new crop in the summer; but these do not bear fruit till the next year, and are more tender and liable to be killed by frost during the next winter, than older and more woody branches.

"In the spring, the trees are carefully inspected, and where a double bud is observed, the gardeners, who are able to distinguish a leaf-bud, which is more sharp, from a fruit-bud, which is rounder, pinch out the leaf-buds, without hurting the fruit-buds; these, as they receive the sap prepared by the plant for two purposes, produced fruit of double the ordinary size; this is done at Paris between the first and tenth of June; but these leaf-buds may be suffered to expand a little, till they can be distinguished with certainty; they must not all be destroyed at the same time. In cool seasons, the ripening of the fruit is hastened by inserting a drop of oil in the eye, from the point of a pen or tooth-pick.

"It is necessary in dry seasons to water fig-trees; the nature of the plant requires to have its roots cool, while its head is exposed to the hottest sun. If planted against the south wall of a house near a spout that brings water from the roof, it thrives luxuriantly. Figs do well also in a paved court; the stones keep the ground under them moist and cool, while the surrounding buildings reflect and increase the heat of the sun's rays."

From the Genesee Farmer.

LATE MOWED HAY.

The editor of the Western Farmer has objected to our recommendation of mowing after harvest. We hope he may be enabled hereafter to make more accurate observations.

In our youthful days, it was the practice to mow the natural grasses as soon as might be after they came into bloom. The hay was of a beautiful green; and all persons, as far as we knew, thought it must of course, be the best. About twenty-five years ago, our attention was first turned to the subject. Farmers in this quarter, cut their grass at such times as were most convenient; that is to say, a part was generally cut before harvest; but the principal part, owing to the pressure of other business, was cut after the grain was secured; and the same motives of convenience induced us to adopt the same practice. We found however, by repeated observations, that our live stock, whenever they had the liberty of choosing, rejected the green hay, and preferred that which had been well matured, although of a rusty appearance.

Having clearly ascertained the fact we inquired of some of our most intelligent farmers who were also acquainted with the value of well ripened hay, what was the cause of this preference? and the purport of the answer we received, was as follows: "Grass cut before it is matured, contains little or no saccharine matter; the juices turn sour, like wine that is made of crude or watery grapes; and the sense of taste in chewing two stalks of two kinds can distinguish them at once—the one being much more sweet and pleasant than the other."

The notion that plants are always nutritious in proportion to their quantity of soluble matter, is erroneous. The quality of that matter, is of more consequence. Sugar is supposed to be more nutritive than any other substance; and no plant has yet been discovered that produces it in such quantities as the sugar cane. This is one of the natural grasses; and it is only cut when the plant is mature. Indian corn is also one of the natural grasses, and its stalks yield much saccharine matter. In the revolutionary war when our intercourse with the West Indies was interrupted, many families were supplied with molasses obtained from this plant, but the stalk was always used when it was well ripened.

The leaves of the cane are entirely rejected in the manufacture, as the sugar is not deposited in any part except the pith; and the last remark will apply to plants of Indian corn. Sugar is also obtained from the pith of the Bamboo, another of the natural grasses. We mention these things to show by analogy that though the leaves of timothy may assume a rusty brown, the deterioration, if any, is more than compensated for, by the increase of saccharine matter in the stalks.

We are not prepared to say that the artificial grasses yield sugar in any notable quantities; or that the plants should be well ripened before they are cut for hay. At present we rather incline to the opinion that a distinction in this respect ought to be made between the two natural orders; and that the latter may not be improved by standing very late in the season.

From the New York American.

COOKING BY GAS.

This new application of gas seems to us of great promise, for economy, comfort and safety. We had heard nothing of it until a few evenings ago, on the invitation of Mr. *L. Suydam*, president of the Manhattan Gas Works, we had an opportunity, at his house, both of seeing the process of cooking, and verifying the fact that what was thus cooked, was "well done," even though not "quickly done".

The apparatus is of great simplicity. A circular or eliptical burner of such dimensions as may be needed—in a large family several of different dimensions would be required—is constructed, pierced with numerous and very small apertures, so that all the gas that passes may certainly be consumed. In the centre of the circle, is a permanent perpendicular spit, on which the joint to be roasted is impaled, a sheet iron funnel-shaped chimney, large enough at the bottom to include the lights, and tapering upwards so as to concentrate and reflect the heat, is then placed over the whole, and the cook may go about any other business, for the next two or three hours, fully assured on coming back at the end of that time, of finding the meat well cooked. But this is not all. Over the funnel-shaped chimney is placed a large tin vessel divided horizontally into two compartments—the lower one serving as a kettle to boil water, the upper as a vessel in which to boil meats or vegetables, and the same fire and the same time required for roasting, will also suffice for boiling the water, and cooking the vegetables. The cost for fuel of such a fire, as we saw, by which a 12lb piece of beef was roasting, was stated by the superintendent, Mr. *Barlow*, at two cents an hour—or six cents for the whole period for cooking dinner—add to this the further economical advantage, that you only light your fire when you want it, and extinguish it the moment it has fulfilled its purpose, and we have a strong argument on the score of cheapness.

It is obvious that any number of these burners may be arranged—all to be supplied by one main leader—and as the cost of these fixtures is small, and only the gas actually used is paid for, it would be expedient always to have several of them.

Of course the value of this new application of gas depends upon proper care in the use of the apparatus, and on the part of the company, in the preparation and purification of the gas. As to the first, the whole thing is so simple, that except through wilfulness there could be no mistake, and as to the purification of the gas, the interest of the company would be so great in seeing to that, as upon its fredom from smell and brightness in burning, its general use would essentially depend—that little need be apprehended on that score.

Upon the whole we confess ourselves amazingly taken with this kind of fuel—and recommend to our friends to ascertain, at the works of the Manhattan Gas Company, the cost, and the advantages particularly in hot weather, of such kitchen fires.

For the Farmers' Register.

ON DRAINING, AND RECLAIMING LANDS, SUBJECT TO INUNDATION FROM FRESHETS, BY DIVERTING, AND STRAIGHTENING THE BEDS OF STREAMS.

The figure in view, exhibits a body of creek low grounds, drained and reclaimed from freshets, in which

A F C D E represents the channel of the creek.

A F C the part of the old channel to be changed.

A B C the new channel, cut through the middle of the low grounds.

G H I J K L M, a margin ditch on the border of the first low grounds.

S, S, S, S, &c. ponds, drained in different parts of the low grounds.

t, t, t, &c. little ditches, many of which rendered useless by the main drain.

O P Q R, a conductor at the foot of the hill, at the border of the second low grounds.

T U V W X Y, outlets from the conductor into the margin ditch.

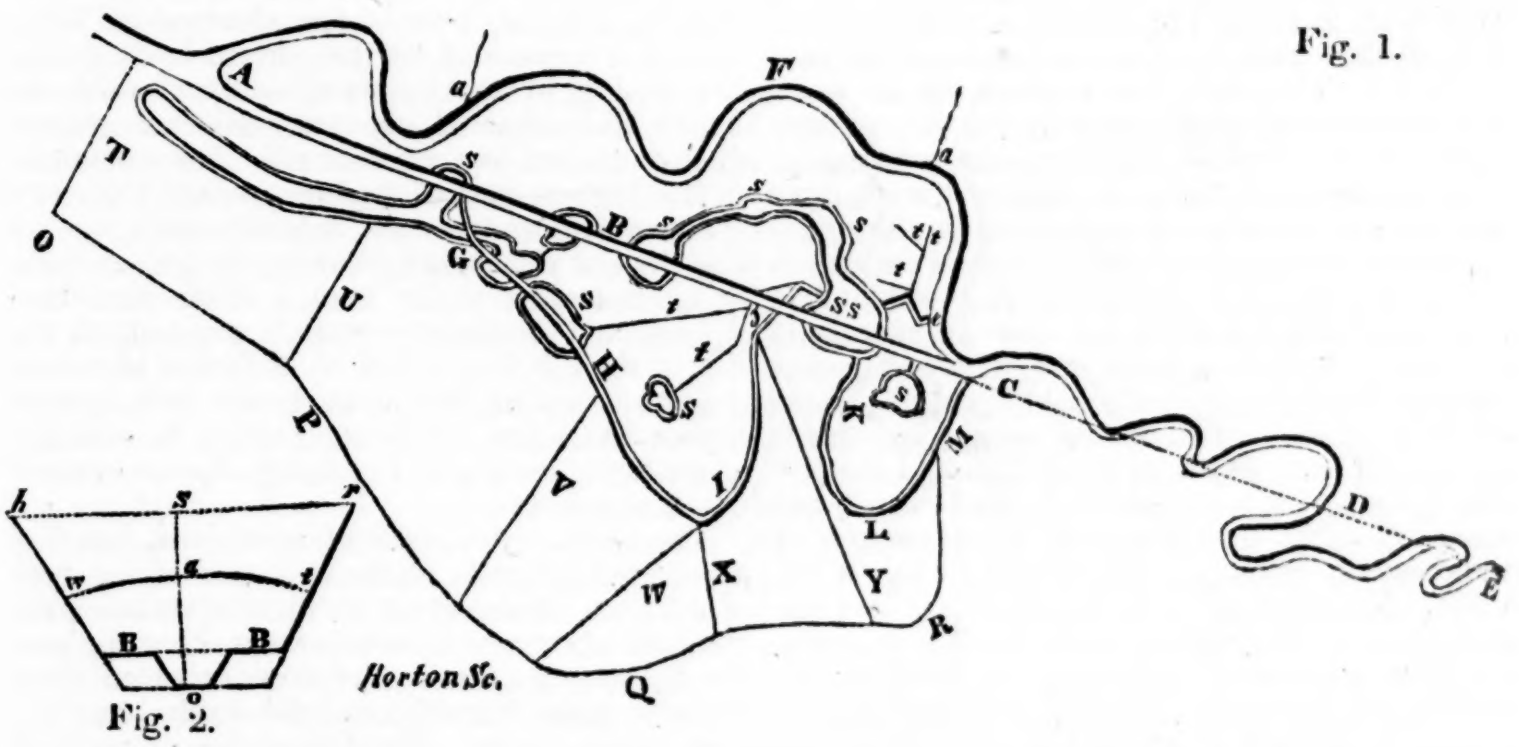

Fig. 1.

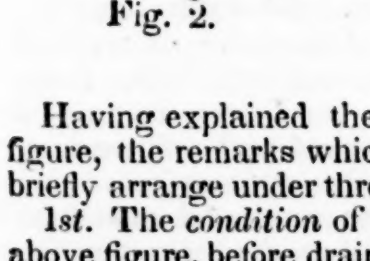

Fig. 2.

Having explained the general features of the figure, the remarks which accompany it we shall briefly arrange under three heads.

1*st*. The *condition* of the land exhibited in the above figure, before drained and reclaimed.

2*nd*. The method adopted to effect it. And

3*rd*. The effects produced afterwards, and the advantages derived to the land, from the whole operation.

First then in regard to the *condition* of the land. It was very subject to *inundation*, so that in extraordinary freshets, the low grounds was for the most part covered with water. Secondly, it was in many places excessively wet, being constantly saturated, and often supersaturated with water, oozing out and coming down from the adjacent hills: for the flat being so wide and level, there was no way of getting rid of it except by evaporation. Thirdly, it was subject to continual washings and scourings, occasioned by the stream cutting across the bends of the channel; which washed and gullied places being abandoned, became stagnant ponds that grew up in bushes, and offered a safe retreat for the nursery of black birds, that are more destructive to the young corn than even the freshet itself. Fourthly, the land was inconveniently intersected with a number of small ditches, the birth-place of bushes, and obstacles to the plough. Fifthly, the land was frequently worked out of season, from being too wet at the proper season. Sixthly, it was liable to be worked wet, and when so, the invariable consequence was, a diminution of the crop; impoverishment of the land; increase of draught on the horse; and the land was cloddy all that season. Seventhly, the land was so wide and level, that there were few outlets for the superfluous water, except the old channel; and that frequently at so great a distance, that the ditches necessary to conduct it off were too long, and of course liable to fill up, and too expensive to cut. Eighthly, pasturing the land in this condition was extremely detrimental,

and it must be pastured so, or not at all, frequently. The pasturing of lands in wet weather, especially in long rainy spells, must be very injurious to them, especially arable lands. Cattle, it appears to me, should be kept up during such spells. Lastly, the low grounds were disfigured, with many undrained ponds, sunken places, &c., the effluvia of which, is generally unfriendly to health; though I have never suffered from this cause, the ponds being of small extent. Such was the condition of the land, which leads us to consider

Secondly—The method adopted to drain and reclaim it from inundation.

To do this, I diverted the part of the stream A E C, from its ancient bed, through the heart (or belly rather, of the low grounds, as it now answers the purpose of a main gut, or as physicians would say, the alimentary canal) into a new channel A B C, ten feet wide, and on an average of four and a half or five feet deep, and about three quarters of a mile long. This depth however, was found insufficient; and then I had a small ditch excavated, in the middle of the bottom of the big ditch, three by two feet deep. This gathered the water into a deep, narrow channel, which increasing the velocity of the stream, soon by its abrasions, ripped up the adjacent benches, B B Fig. 2, (which represents a transverse section of the canal, down to the bottom of the little ditch *o*.) The ditch has washed out in width and depth astonishingly, since it was cut, contrary to the expectations of many persons, who supposed that the land being so wide and level, there was little or no fall, and consequently the channel would not wash sufficiently, to take the stream in high water. It is now from 40 to 50, and in some places 60 feet wide, and upon an average of six and a half feet deep: and where it passes through knolls, eight or nine feet in depth. There are holes in the bottom ten feet deep; but this is not the uniform depth of the bottom. I observe that the clay parts of the ditch wash more, and more uniformly, than the sandy parts, contrary to the common opinion. The reason for this is obvious. The clay parts of the ditch are less encouraging to vegetation, than the sandy parts; the grass and weeds springing up from which, catches the trash and sediment, and further promoting the growth of weeds and grass, the roots of these hold the banks of the ditch together, and prevent their being washed away. In dry weather too, the clay cracks in large fissures, and when a freshet occurs, the water rising and running into these chasms, sever large blocks of clay from the banks, which tumbling in the water in a dry state, soon dissolve and wash down the current. These lumps leaving scooped places in the banks, the large projections of earth above also tumble in, and dissolve away. There is another reason: the clay freezes in the winter when the water is down, which pulverizing and loosening it, gives the water a prodigious effect on the banks. If there is much fall at the sandy places, then they wash very much; otherwise they do not: for the vegetation then has no time to cover the banks, the sediment being washed away as fast as it accumulates.

In cutting this ditch, it will readily be seen, by looking on the figure, that the current in the old channel is not diverted from its general straight course A B C D E, (which is uniform in all streams that flow in a certain direction towards the ocean, for however they may meander in particular parts of their beds, they have in the main a straight course,) but only diverted from a part of its old bed, A B C D. On the contrary, the stream is directed more into its general straight course, (which is here southerly,) as the figure shows; for it it were continued where it now runs, above and below, it would be in a right line, with its natural direction, A B C D E; so that it may be considered as only cutting off a large bend or elbow of the creek, about a mile and a half long, following in the measure, all the curves of the old channel. There is much evidence to believe that the stream was once more in this general straight course, (to which attention should be paid in straightening channels,) than when it meandered along the foot of the hill, from whence it has been lately diverted, since the canal now passes through many places which appeared to have been once ponds, (but were entirely filled up when the ditch was cut, with sand, leaves, and rotten wood, as far down as the bottom of the ditch,) no doubt formed by deserted parts, of a very ancient channel, from whence the current must have receded towards the foot of the hill, where it formerly ran; that is, along A B C D. This recession in streams, from more elevated to lower places, is occasioned by the current itself, gradually raising, by depositions of mud and sand, the banks of its channel, above the adjacent ground, (hence the bed of a creek or river lies oftentimes in the highest part of the low grounds,) where if it meets with obstructions, it retires with the fall into the low places, and following the indentations, or natural sinks of the land, it forms numerous curves, and becomes extremely crooked, till the foot of the hill fixes a limit to its further mutation, at least for a time; but as its banks here become higher than the surrounding land, it changes again to the same place probably, from whence it first was diverted.

The clearing and cultivation of land, has had a powerful influence on the mutation of the beds of streams. Subsequent to these operations, the channels of streams have become much straighter, less branching, (that is, the water collected more into one main channel,) and the banks have become much better. By felling the timber, and loosening the soil of the adjacent hills, many ponds and sunken places have been filled up in the low grounds, with the sand and soil washing down from thence; and the streams too, being loaded during freshets, with sand and mud from the same source, have filled up the holes they formerly made, and the parts of the crooked channels they have deserted, and have formed by their increased velocity, and the sediment they deposite in freshets, new and straighter channels for themselves, and higher banks. The executor of the work under consideration, a very intelligent man, and one of observation, and who had had 50 years experience on the subject of mill races, and straightening creeks, observed to me, that before the country was much cleared, when he first turned his attention to the subject of ditching, the streams, where the low grounds were wide especially, divided into numerous branches, and ran in many places, nearly over the whole low grounds, in so much, that it was oftentimes difficult to distinguish where the main current flowed—that the

flat lands were more indented with ponds, and disfigured with quagmires, than at present. This cannot be ascribed to ditching, and draining of low grounds of late years altogether, (for although ditches drain ponds, they do not fill them up, unless a constant current passes through them,) but is owing chiefly to ploughing the hills, and removing the trees from the low grounds, by the trunks of which, the current is divided into numerous channels, and around the roots of which deep holes are scooped out, to the great impoverishment and disfiguration of the land.

At the termination of the ditch C, there is an excellent draw-off for the water; (which is very important in an effectual piece of work of this kind) the old bed of the creek being there wide, and nearly straight for a considerable distance: it is also straight above, at the upper end, which affords a good inlet, which is also very essential; so that the water has a straight course now for about a mile and a quarter, without obstructions. Any one may see at once the advantage of a continuation of the new channel below, and from the crookedness of this part of the creek, may form some idea of the necessity of straightening the natural beds of streams in general; for which purpose, this part of the old channel was appended to the figure. Though my land below this point is very little subject to inundation, except immediately on the bends of the creek, it being for the most part what is called "seconds," and of course out of the reach of freshets. The advantages derived to the land below, by an extension of the ditch, might not justify the expense, unless combined with those resulting to the low grounds above, where the effect would be greater. These two considerations jointly, might justify perhaps, a continuation.

In regard to the execution of the work under consideration, it does not differ materially from what is in common practice. Figure 2, is designed to exhibit at once, the manner of excavating the earth, in cutting the ditch. It represents a transverse section of the canal: *h* and *p* represent the sides of the canal; B B the bottom; *h s p* a line drawn across the top to measure the ditch; *s a o* a plumb line dropped from this to measure the perpendicular depth of the ditch; *o* a section of the little ditch, cut in the middle of the bottom, B B, of the canal. The object of cutting a canal of this sort, that is to contain and carry as much water as possible, depends on the *form* of this figure, for the *velocity* on which the *washing* and *quantity* of water carried depends on it. The velocity depends upon the narrowness of the bottom: but the narrowness of the bottom depends (the width remaining the same) on the inclination of the sides, or the angle they make with the bottom; therefore the velocity is as the inclination of the sides: but the action on the sides and bottom depend on the velocity, therefore the washing depends on the narrowness of the bottom. So that it appears that if the form of the figure was altered in such a manner as that the sides would meet in an angle at the middle of the bottom of the ditch, the velocity of the water would be greatly increased. But as this could not be practised in so large a ditch, the sides ought to slope in such a manner as to make the bottom not more than a fourth of the width of the top. But it must be observed, that if the velocity of the water depends on the inclination of the sides, the caving, which is a consideration, depends on their perpendicular form; so that the ditch ought to be cut in such a manner as to combine the two advantages derived from caving, and increased velocity of the water. The fact that the same volume of water would run swifter by diminishing the width of the bottom, induced me to collect the thin sheet of water running on the bottom B B of the canal, into a channel with a narrower bottom, *o*. But the effects produced by admitting the current into the new channel, we shall notice more particularly hereafter, my object here being simply to show how the work should be executed, without entering minutely into the reasons for it, or to enumerate the advantages derived from it, which come more properly under our second division of the subject. The mouth of the ditch should be cut wider than the other part of it, for 50 or 100 yards down—and a stop made in the old channel. The next means adopted, in point of importance to the canal, to drain the land in question, was the cutting of the margin ditch, and other smaller ditches and conductors, already mentioned, a better idea of which may be had by looking on the figure, than by any verbal description, which would be unnecessarily tedious—when our object is brevity, without leaving out essentials. Sufficient allusion however will be made to them to show their design and importance in the figure, as we pass on.

Having pointed out the method adopted to drain and reclaim the land, we proceed—

Thirdly—To show the effects produced by straightening the old channel, and the advantages derived to the land through which it runs. Besides other advantages which we shall hereafter enumerate, the two principal ones, in view of which the work was undertaken, were completely obtained; that is, a thorough *drainage of the land*, and the *reduction of freshets*.

The manner in which the ditch operates as a drainer, and its absolute necessity in this body of flats, to drain it effectually, will be first pointed out. What renders it necessary to drain a body of land of any description, is the redundancy of water, over what is necessary of that element, for vegetation. This is of three sorts: rain, spring, and pond waters; but as ponds are collections of rain or spring water, they may be reduced to two only. The method which has been adopted to get rid of these, when in excess, is called draining. The aqueducts generally necessary to drain a body of flat land, are eight in number: the main drain, or "main carrier," as it is sometimes called, (a term borrowed from the irrigation of land,) margin ditch, surface ditches, grips, trenches, or what are commonly called water-furrows, pond ditches, pits or perforations, and hill-side trenches, (usually called conductors,) though every ditch, or trench, which carries water is properly a conductor. The main carrier, is a large ditch cut through the middle of the low grounds, the object of which is to intersect all the subterranean passages of water, or veins, that it may flow off, and to answer the purpose of an outlet to the water, more particularly of the margin ditch. The margin ditch is generally a crooked conductor, opened either at the seam of the first and second low grounds, or at the foot of the hill, at the margin of the first low grounds; the object of which is, to receive the water of the surface ditches, and

hill-side trenches, and to empty it into the main carrier. Surface ditches, as called from their design to take off the rain water from the surface, are generally cut with a spade, either obliquely (with the *fall*) or at right angles to the margin ditch, and frequently to the main carrier, the object of which is to receive the water of the grips, and to empty it into the margin ditch. The grips are cross furrows, made by the plough and hoe, along an indentation across the beds, the object of which is, to receive the water of the trenches, or water furrows, and to empty it in the surface ditches. The trenches, or water furrows, are made with the plough, and scraped out with the hoe between the beds, and are designed as a receptable of the water which falls on the beds, and to empty it into the grips. Pits, or perforations, are holes made with the spade, or bored into the ground to sink the water by some subterraneous passage, when it is retained by a stratum of clay, when there is no convenient outlet for a ditch, usually made in basins or ponds. When the stratum of clay is cut through, the water sinks into the land. Places have been drained in this way, where success could not be had in any other. Pond ditches are those which are designed solely to drain off pond water, and should always be cut through and below the bottom of the pond. Hill-side ditches or trenches, when made near the foot of the hill, are designed to take the water which falls on the hill-sides, and tops of the hills from the flats, and to convey it by outlets, as in Fig. 1, into the margin ditches; so that the water which at first falls on the surface of the beds, runs into the water furrows; out of the water furrows into the grips; out of the grips into the surface ditches; out of the surface ditches into the margin ditch; out of the margin ditch into the main carrier; out of the main carrier into the old channel; out of the old or natural channel, into the ocean. But the farmer must not think that now he has gotten entirely rid of his superfluous water—that it is gone forever, and lost in the ocean. Though but a drop in that "bottomless abyss," it will come back again, it may be the very next day, in the form of drops falling on the very spot from whence it started. "The sun riseth, (saith the wise man) and the sun goeth down, and pants for the place from whence he arose. * * * All rivers run into the sea, yet the sea is not full. Unto the place whence the rivers come, thither they return again." Out of the ocean it goes into the air, drawn up in exhalations by the heat of the sun, (or rather the heat removing the pressure of the atmosphere on the surface of the ocean, the water rises, being divided into small particles by absorbing heat, by its specific levity into the air;) out of the air it goes into the clouds, or rather it assumes the form and appearance of clouds; clouds being nothing more than these watery particles made visible by becoming denser. Then comes the wind, and blows them back over the place from whence they came, and being condensed by cold (the absence of heat) and by gravitation, are precipitated in drops of rain, hail, or snow, to the earth. Nor do they stop here: the same law which precipitated them to the earth, continues to roll them on its surface, which is spherical, again into the furrow from whence they started. Thus a constant circulation is kept up. The sun is the grand cause of this circulation of waters, (as he is of the tides) and the winds, which blows them back upon the land, and how strange soever it may appear, is the remote cause of the wetness of the land, and the freshets of the stream, to whose attractive force, and to the influence of whose heat, nearly all the phenomena in nature may be traced.

But to return. In the foregoing remarks we have endeavored to show that the operation of draining proceeds upon principle: that the nature of the water naturally pointed out the nature of the aqueducts necessary to carry it off of the land; and we might have added, the *figure* of the land, and the *fall*, their direction. We will now show the application of these principles to practice, by a reference to the figure, though little more here is necessary than a reference to the different aqueducts, which has been already made. In this piece of ground the main stream which runs through the land, suggests the propriety of a main carrier, **A B C**, and the underlaid water of the whole low grounds, and the veins of water making across to the old channel. When this operation was performed on the land in question, spouts of water, after a rain, might be seen all up and down the sides of the ditch, like blood spouting from the section of a vein. The rain water which falls on the second low grounds, and the springs at the margin of the first low grounds, point naturally to intercepting margin ditches. The rain water which falls on the surface of the ground, between the margin ditch and main drain, call for the construction of water furrows or trenches, between the beds; the grips which intersect them, and what we have called surface ditches, as a receptacle for it. The surface ditch, *t*, which connects the margin ditch and main drain, and which nearly bisects this part of the flat, shows this, into which the trenches empty obliquely. On account of the high banks that are made on the sides of these ditches, it makes it necessary to run the grips at the foot of these banks, parallel with the ditch, to avoid the necessity of deep and expensive outlets, or terminations of the trenches, through this bank. Such banks in the first instance, should never be formed, but the earth scattered at a distance over the ground. There should be as few of these surface ditches as possible. They are only necessary as outlets, for the grips and trenches, when the margin ditch and main carrier are not convenient. When they are emptied into the first of these, it should be done by the medium of a grip, which may be called a parallel grip. The beds, and of course the trenches, however, should, if the fall admit, run parallel with the main drain. Next, the rain water which falls on the hill-side suggests the propriety of a conductor at the foot of the hill, **O P Q R**, to turn the water from the second low grounds below, on which it would empty: and the size of the hill, or a number of hills together, and the quantity of water collected in it, show the necessity of occasional outlets, **T U V W X Y**, into the margin ditch. Pond water, if composed of rain water collected into sunken places, only require straight ditches cut through them, sunk below the bed of the pond, to drain them; (unless it be such as the margin pond of springs before mentioned,) such as the ponds **S, S, S**, &c., through which the main drain passes. When an outlet is inconvenient, or expensive to cut, and the water held by a retentive bottom, it points to the necessity of perfo-

rating the bottom. Nature teaches this when she cracks these impermeable strata by the heat of the sun, and the water sinks in the fissures. Clay lands, and the bottoms of evaporated ponds, crack sometimes to the depth of three or four feet, or more; hence the thirsty nature created of these soils, and the quantity of water they drink through these throats. Where a body of low ground is generally of this character, it requires double the quantity of water in very dry weather, to produce a freshet, these fissures drinking in the water as fast as it spreads over the land. In this way, such soils become very rich, these interstices being filled with the sediment of the water; hence the streaked and veiny appearance of the soil, when cut with the spade. It is through these fissures that so much rain water is collected under the low grounds, in the permeable stratum of sand below the clay. For the water that falls near the old channel, and the springs about the same, *that* will answer as an outlet which answers the purpose now of another margin ditch along the opposite range of hills at the other border of the low grounds.

By a sort of *comparative* anatomy, the constant circulation of water in the earth and atmosphere, by the distribution of showers, and again draining it off by streams, may be likened to the circulation kept up in the human body by the heart, veins, and arteries: in which the ocean represents the heart, the rivers the veins, which conduct the water to it, and the clouds the arteries, by which after a certain preparation, it is again distributed over the surface, and through the body of the earth. In this system, the main drain A E C, may represent one of these large veins in the body of the low grounds (the *Vena Cava*, if you choose—the largest vein in the human body,) and the minor aqueducts, its various ramifications. The beauty of this system is, that the water is not suddenly emptied all at once into the *Vena Cava*, but by various avenues, gradually enlarging, as the water accumulates.

Thus I have endeavored to illustrate the theory and practice of draining; all the fundamental principles of which, and their application, are embraced in this figure, the most distinguishing feature of which is, the main carrier of the stream A E C.

We will now proceed to point out the manner in which it acts, in the reduction of freshets. Reclaiming of land, subject to inundation, from freshets, is a branch of draining upon a large scale. The principle is the same as in drawing off any other superfluous water. The object of the reduction of freshets, is to prevent the injury of land and the destruction of crops. The former is done by washing and disfiguring it, and the latter by drowning the plant by soaking the roots, or by destroying its structure, by caking the leaves with mud, thus stopping up their vessels. To prevent inundation, either of two things are necessary; that is, either to clean out the old channel, and occasionally straightening its bends, or changing entirely the bed of the stream. In this instance, the latter operation is exhibited. The current here is taken out of a very crooked channel, and made to run in one entirely new, and perfectly straight. The reason why this channel prevents the inundation of the land, will be the principal subject of the remarks which follow. It is entirely owing to the increased velocity, given to the current in it. This depends entirely on the form and construction of the channel. As soon as the current is introduced into this channel, it becomes subject to all the laws which govern the motion of this fluid in conduit pipes and open canals. Hence all that is known of these laws, may be here applied; and hence too, the necessity to the drainer, of a knowledge of those sciences, hydrostatics, and hydraulics, (latterly dignified with the title of hydrodynamics) which make these laws the subjects of their investigation: the first of which concerns the equilibrium, weight, and pressure of fluids—the latter, their motion. If a knowledge of dynamics, (the action of forces on solid bodies resulting in motion,) is useful to every one who "owns a horse," in order to understand his speed and tractive powers, surely an insight into the above sciences, will be of no disadvantage to him who owns a canal, to understand the effects of the velocity of its current, and its power on the land. Water is subject mainly to two laws, namely: pressure, and the force of gravitation—whether it is confined and at rest, (for it never is at rest unless it is confined,) or in motion. The first is that force by which its particles press on and against each other, or on any solid body. This pressure is equal in all directions, upwards, downwards, and laterally, and is increased by the pressure or weight of the atmosphere. Upon this principle water spouts from the side of a vessel, when a hole is made into it, and as often as this operation had been performed, the property was first distinctly stated by Pascal. The second is, that force which draws bodies to the earth, or by which a lighter body is drawn by a heavier: and although here, as in the other case, millions of apples had fallen to the earth in the sight of the vulgar, Newton first discerned it, with a philosophic eye. But as these two laws are resolvable into the same (for what is the pressure of water, but its weight; and what is its weight, but the force of gravitation drawing it down?) all the phenomena of this fluid may be said to be governed by the force of gravity.

Let us see now, how the atoms of water are put and kept in motion by these two laws, which we shall consider as distinct, for the sake of clearness. First, by the force of pressure. If the sides of a vessel of water, sitting on a perfectly horizontal level plane, be suddenly taken away, the fluid within will run off in every direction on the plane, even though it have not the slightest inclination, and will continue to run and spread until there is not one particle of water above the other, to press it down when it ceases. The pressure of the water then is as its depth: and therefore as this diminishes, the pressure diminishes, until the water becomes so shallow and thin, that it ceases to run. But its velocity is as its pressure; therefore its velocity is as its depth (when unconfined, and in motion.) Therefore by increasing the depth, the fall (or inclination of the plane) remaining the same, the velocity is increased. The reason of this pressure in water is this: the atoms or particles of water, are so mobile, round, and slippery, and the cohesion of them so slight, that the upper particles pressing upon the lower ones, push them to one side: for the atoms of water are not like lead, or any other compressible substance, the particles of which may be mashed together—but the inferior atoms rather than yield to the superior by

compression, slip to one side, and if not confined, they produce motion. In this thing, water or fluids differ mainly from solid bodies: the latter press only at the bottom, but the former have a lateral pressure in addition: and the nearer they approach the nature of fluids, the more they have of this property. Thus, in a barrel of shot, or sand, there is a pressure on the sides; hence such bodies have been called by philosophers, *gross* fluids. The pressure itself, which causes the motion here, is produced by the weight of the atmosphere, and the force of gravitation; but these would not produce motion in a solid body, because they have no lateral pressure. Having started the motion then by pressure, let us see how it is kept up by gravity. Water, like every other body, is subject to the force of gravitation—(with this difference, that its force on water may be overcome by removing the atmospheric pressure, and making the particles extremely light by heat.) By this law, a drop of rain falls to the earth; and if it be caught on the side of a house or inclined plane, it retards its motion some, but it still rolls on, in proportion to the elevation of the plane, until the plane be placed perfectly level or horizontal, when the law of gravitation acting perpendicularly to the plane, pins the drop of water to it and it stops.

If the plane above mentioned then be the least inclined, the motion of the water in the vessel begun by pressure, will be kept up by the force of gravitation: and the velocity or swiftness of the water will be in proportion to the inclination of the plane. Hence we infer that the velocity of the water is always in proportion to the inclination of the plane on which it runs. And therefore by increasing the inclination of the plane, we augment the velocity of the water.

The velocity of water therefore depends upon its pressure, and the force of gravitation, and these depend upon the depth and inclination of the plane. But the depth of the water depends upon the depth of the channel, and the "fall" depends upon the inclination of the plane, therefore the velocity of the water is as the depth of the channel, and the fall which it has. By increasing the depth of the channel then, and the fall, we increase the velocity of the current.

But again the discharge of the quantity of water on an inclined plane, or in a channel, (which is nothing more than an inclined plane, on which the water is confined from spreading laterally,) is as its velocity, therefore the discharge of water in any given time, is as the depth of the channel and the fall of the bottom. The velocity of water in a pipe, or open channel, is as its shortness, for the longer the tube the more the resistance the water meets with from friction on the sides, &c., hence a short tube will discharge in a given time, (of the same aperture,) more water than a long one, provided the head of water to be discharged is the same. By shortening the pipe or channel then, we increase the discharge.

The velocity of water in conduit pipes, or open canals, is in proportion to their straightness. "The motion of a fluid is further obstructed by any violent change of celerity or direction. Whether the channel be contracted or enlarged, the change is unavoidably attended by a proportional loss of impulsion. Any sharp flexure of the pipe or conduit, will occasion a still greater waste of the inciting force."* The retardation of velocity of water in canals and pipes by deflections in them, have been accurately calculated, for angles of every size. Thus, the retardation produced by a right angle, is greater than that produced by an obtuse—and by an acute angle, greater than either. We may infer therefore, that by straightening the channel, the velocity is increased.

These are some of the causes that accelerate the velocity of water, in pipes and canals. There are a variety which retard it. First, by accidental obstacles which it meets with in its course, by crookedness of the channel, &c. By its pressure against the bottom, sides of the channel, and at top by the pressure of the atmosphere against which it rubs. This pressure produces a friction, which retards the motion. This friction is greatest in a stream as you approach the sides and bottom; hence on the surface in the middle of the stream, the velocity is always greatest. Adhesion of the particles of the fluid to the sides of the channel, is another obstacle to motion. We may infer then that in proportion as these obstacles are removed, the velocity of the water is increased; and such as cannot be removed, must be overcome by increasing the velocity.

Having proved then, upon the principles of science, that the motion of fluids in conduit pipes, and open canals, is produced and continued by hydrostatic pressure, and the force of gravity—and that the velocity of this motion is increased, 1st, by the depth of the channel—2ndly, by the inclination of the bottom (or fall)—3rdly, by shortening the pipe or channel—4thly, by removing obstructions—and 5thly, straightening the channel—we will now by way of application of theory to practice, show that all these causes, are in operation to increase the velocity of the current in the canal, A E C, in the figure exhibited above.

First, it is plain that the new channel is deeper, being cut several feet deeper than the old channel, and more uniformly so. This is of great advantage in reducing a freshet; for suppose a sheet of water a foot in depth be spread over a flat 144 feet in width, and a mile in length, it may be sunk into a ditch 12 by 12 feet deep, leaving out the velocity of the water. An enlargement of the capacity of the channel, is of little advantage however, where water is constantly accumulating without increased velocity. This capacity in depth and width of the channel is not stationary, but increases with the velocity of the stream.

Secondly. It is plain that the fall or inclination of the bottom of the ditch is increased: for the fall which was before extended along a mile and a half, is brought within three-quarters of a mile. This makes the difference in the velocity and discharge of water, about the same as between the velocity and discharge of two troughs, one of which is half as long, and double of the elevation of the other (that is doubly as slanting.)

Thirdly. It is very evident by looking on the figure, the distance, and of course the channel, is shortened. The deserted part of the old channel is nearly, if not quite, double the length of the new channel; hence the pipe through which the water now flows, is shorter than the former one; and therefore the velocity and discharge is greater.

Fourthly. It is further manifest that the new

*Dr. Jamieson's Dictionary of Arts, Sciences, &c.

channel is straighter than the old one (to say nothing of other obstructions) water runs much faster in a straight channel than in a winding one, although the banks might be perfectly smooth, and gradually curving; for, when water runs in a right line, the hindermost particles push the foremost ones along straight before them; but in a curvilinear, or angular one, the hindermost particles push the foremost ones to one side out of the way, and the latter having to turn entirely round, describing a circle, and then following on, are retarded in their motion. This is the reason of those little whirlpools, at the edge of the swift part of the stream, next to the eddy parts. In the old channel there are nine large sudden curves, besides numerous smaller ones, which are avoided by straightening the channel. In the last bend, the old channel runs at right angles with itself, where it rushes against the opposite bank, which is fifteen feet perpendicular, which in freshets, would dash the water over the land this side, which of course would break over the low grounds on the other side of the old channel, between this bend and the mouth of the ditch: which is a small piece of flat squared out between this part of the old bed, and a steep hill, running within a few yards of the mouth of the canal, which was formerly subject considerably to inundation, and ought to have been appended to the figure. The curvilinear form of every channel, shows how much a current is opposed to deflections, for let these bends be as sudden as they may, they always turn by a gradual curve, instead of an angle; hence if one stream be let into another at right angles, it will soon change itself more suitable to the direction of the main stream.

Fifthly. It is plain that the stream is freed from a great many obstructions which retard the velocity, besides the bends of the channel, which like so many dams, obstruct its progress, over and through which, it breaks, to the injury of crop and land. Hammocks, (formed by trees thrown across or falling into the old channel, logs, rafts of wood, sticks and trash of every description, bushes growing on the banks, &c.) are constantly turning the stream out of a straight course, which it is ever seeking. The current now runs where there are neither stumps nor trees (on which account too, it was more easily excavated.) As to those obstructions which belong both to straight and sinuous channels, such as come under the head of pressure, friction, &c.—these are overcome in a good measure, by all those causes which increase the velocity of the current in its new channel.

Thus we have shown how the velocity is accelerated in the new channel, and the reason for it; from which it seems it must be more than doubly increased. Now as the discharge of water is as the velocity, the canal must discharge in the same time, more than double the water of the old channel. This rapid discharge prevents the accumulation of water in the channel, out of which it breaks, and inundates the land. And what water is supplied by the freshet is drawn off much faster, and of course the stream is down much quicker. This discharge of water is further increased by enlarging the capacity of the channel, which is the effect also of the velocity of the water, to which the washings, in depth and width, and the cavings of the sides, are always in proportion, for which there is abundant authority. "The increase of velocity [in a stream,] increases the action on the sides and bottom, in consequence of which the width is augmented, and sometimes also, but more rarely, the depth."—*Gregory.*

"A velocity of three inches per second, at the bottom, will just begin to work upon the fine clay fit for pottery, and however firm and compact, will tear it up."—*Du Buat.*

"A velocity of six inches will lift fine sand—eight inches will lift sand as coarse as linseed—twelve inches will sweep along fine gravel—twenty-four inches will roll along round pebbles, an inch in diameter, and it requires three feet three inches per second at the bottom, to sweep along shivery angular stones, of the size of an egg."—*Robison on Rivers.*

There is no danger of a canal of this sort washing and caving too much, a notion which with some, has obstructed this branch of draining. The laws which fix limits to channels, are as certain and immoveable, as the hills themselves. The current and the channel will always adapt themselves to each other, until they become permanent. The effect is produced in this way. As it is the increased velocity of the water which increases the depth and width of the channel, so it is the diminution of this velocity which stops the washing and caving. The velocity of the water in the canal will diminish in proportion to the enlargement of the area of the section of the canal, represented by Fig. 2; or to speak more in the style of hydraulics, "when the sections of a river vary, (the quantity of water remaining the same,) the mean velocities are inversely as the areas of the sections."—(*Gregory.*) That is, as the channel widens, (the quantity of water) the depth diminishes, and of course the hydrostatic pressure diminishes, and the water spreading over a wide bottom, the friction increases, and the velocity of the stream diminishes. Now if a freshet comes, a swift current is formed in the middle of the stream, and the water next to the sides of the ditch is more of eddy: the swift particles of water push the eddy ones to one side, and these being loaded with sand and mud; and the surface of the stream being convex, as represent ed in Fig. 2, which is represented by the curve line (*t a w*) they roll towards the sides, where they deposite the mud and sand. The reason of this convexity of the surface of streams, which may be seen by putting the eye on a level with the surface, is that the water in the middle, at the surface of a stream, is swifter than towards the sides and bottom, being farthest removed from friction, and being swifter, it loses some of its weight and rises, and being retarded too by the eddy water on each side which it meets with, it accumulates in the middle. The surface in the middle of some rivers, is three or four feet above the edges of the water at the sides; hence a loose boat floats to the bank. The sand and mud are deposited, while the stream is falling. Mud is always deposited by eddy water, and sand by running water. The mud suspended in the water is carried off by the swiftness of the current, while the sand is let fall. But where the water is still, the mud has time to precipitate. This is the reason why the clay is deposited on the edges, and the sand at the bottom. In long dry spells when the velocity of the stream is weakened, it gradu-

ally contracts its channel by mud and sand, and the running water fills up all the deep holes with sand, and the bottom becomes smooth. When the current gets the sand to the edge of these holes, losing its velocity, and being able no longer to carry it, it drops it in. If the drought continues, grass and bushes are apt to grow up, and form obstructions. But the next freshet that comes, will sweep out all the holes, and bear off all the banks thus formed; and so on every succeeding freshet, sweeping off the alluvial formations of the preceding one by increasing the velocity of the current, until a "king freshet," puts up a piece of masonry on the sides of the channel, and says to all succeeding ones, "thus far shalt thou go, and no farther—here shall thy proud waves be stayed." Upon this grass and bushes grow up, and thus the bed becomes permanent, from a diminution of velocity, without which, neither rock itself, nor the tenacity of the soil, could fix limits to the beds of rivers, and the earth would be washed from under us.

Having pointed out the manner in which the new channel operates in the prevention and abatement of freshets, we will briefly enumerate some of the changes which have resulted, and the benefits which have been derived to the land since the excavation of the main carrier.

In the first place, the old channel is fast filling up, and trees are growing from the bottom of it. My intention is to speed this operation, by cutting a small ditch through the middle of the bottom. This will drain the string of ponds, and by admitting the two little branches R, R, into it (which now serve to change the water in the old channel,) will form a current that with the aid of freshets will fill up all the holes.

Secondly—the land may be cultivated to the waters edge, in the old channel and the trees cut down, and the bushes grubbed up to the same, and shortly the bed itself be cultivated, for corn is now growing on a part of it, which is as high as the adjacent ground.

Thirdly—the old bed affords an inexhaustible source of manure—a compost of sand, mud and leaves.

Fourthly—all the washed places are filling up, some of which produce better than the adjacent ground. The little useless ditches also, and the ponds, S, S, S, S, are filling with mud and sand. Any pond now may be filled with sand, by passing a current into it out of the ditch; or drained, by cutting one out of it into the main drain. The land of course now is more level, and brought more in a body for the plough, which may at length cross all these places.

Fifthly—the island formed by the old and new channel is gradually becoming higher, from the deposites of the freshets. If you can ever get a current to surround a piece of land, it will soon raise it out of the reach of freshets, for the eddy water is always in the middle of a circular current, and where the eddy water is, there will be the deposites. The current in this instance takes off earth from the opposite bank all around, and throws it on the island; hence islands and peninsulas, or the bends of a channel are generally the highest parts of low land: and hence too, they are richer from the deposites, than other places. The formation of islands is handsomely illustrated by filling a vessel with water that has a little sediment in it, then whirling it round, when the sediment will be collected in a little pile in the centre of the bottom. Here the water is eddy in the middle, but formed into a swift current on the sides of the vessel, which it washes severely. In this way a single snag in the water, by forming a current around itself, in the form of a whirlpool, has formed an immense island. They are also formed by cutting across the bends of the creek.

Sixthly. The current now never breaks out of the new channel unless it is where it crosses indentations in the land, or some washed place formerly made by the current of the old channel; which when it happens, only serves to fill them up. Before it could break out of the new channel, it would run round the old, first filling up all the low places of the low grounds, (for the land through which the canal passes is the highest part of the ground generally.) This is evident from a property which belongs to water, to equalize itself, or as it is commonly called, to "seek a level." And even if it should break with violence out of the new channel, the distance to the old channel is so far, that it would soon lose its velocity, by spreading over the ground, or meeting the eddy water of the old channel, and so pour out all its sand. Lately, during the greatest freshet I have ever seen in the stream, the current at one place was diverted from the new channel, occasioned by a fish-dam below, which interrupted the fall about two feet, but instead of an injury, it was a great benefit to the land, for the sand which it gently distributed over the surface of a stiff part of the low grounds, was of incalculable benefit to it; and the wheat then growing on the spot, was not a little benefited by this top dressing of "alluvial formation."

Seventhly—any kind of crop may be now cultivated on the island, or any part of the low grounds, with perfect safety; and if there should come a freshet to inundate the land more than ordinary, and the water should spread over any part of it, it would be so much reduced, and so shallow, that it would rather be a benefit than an injury to either land or crop. In this point of view, I look now upon every freshet that may occur. It may be observed that what might be thought a very moderate freshet in the winter season, would be considered an extraordinary one in the summer, when crops are growing. It requires a vast quantity of rain even to fill the channels in the summer season.

Eighthly—the character of the land is vastly altered. Where it was inclined to a stiff clay loam, it is now of a different color and texture—not half so stiff—more open and spungy—drier, and more easily wrought.

Ninthly—the freshets are down in half the former times, and consequently less mud is deposited on the crop, which is the effect most injurious to crops in freshets. Besides, the current being swifter, less mud is deposited on that account, but more sand. A dull sluggish stream deposites nothing but mud.

Tenth—ample outlets are now offered to all the necessary ditches, ponds, &c. the margin ditch in particular, which on account of its length, (being nearly as long as the old channel) could never be kept open, is now intersected nearly in the middle, near the pond S. Before this, it emptied into this pond, which never could be drained un-

til the main drain **A E C** was passed through it. Several attempts had been made to drain it by the ditch *s e*, but on account of the depth of it, (about six feet,) the little fall to the old channel, and the back-water of the old channel in freshets, which constantly filled it up, &c., they proved ineffectual till this main gut, if I may so call it, was passed through this stomach of the low grounds, where all the sand, mud, wood and water collected, and cleared it of its foul contents.

Eleventh—it should not be discarded from the list of advantages that such a ditch, answers very well the purposes of a fence. My standing pasture is in a good measure enclosed by the main drain and margin ditch: nor should a plenty of clear fresh water for the stock in it, furnished so conveniently by the new channel, be thought unworthy of consideration.

Twelfth—how advantageously such a system of draining and reclaiming could be connected with irrigation, is obvious from a single glance at the figure. An inundation of the whole plat of ground, bounded by the margin ditch and main carrier, is completely practicable, with little labor and expense.

The particular advantages here enumerated, derived to the plat of land exhibited in the figure, when properly drained and reclaimed from the injurious consequences of inundation, are not confined: they are such as would result from a general adoption of a similar method, and may be held out as some inducement of a further prosecution of a branch of husbandry, of which little hitherto has been done, and perhaps less known, than any other operation of farming. The increasing scarcity with many, of good land; the exhaustion of the highlands; an acquisition of rich and productive land by draining and reclaiming; an exemption in a good degree from the pernicious effects of droughts, so common in this country, by cultivating moist land; a connection of draining with a well regulated system of irrigation; an improvement of the country in point of health; a connection of draining with a system of enclosing; the permanency of fences on water courses, secured by straightening channels; and finally the abatement of freshets, so universally destructive to crops, and an abridgement of the time they would remain upon the land, and the preclusion of a great deal of anxiety to the farmer, are inducements that ought to render this subject more generally popular. The obstacles to such undertakings, have been already mentioned in some previous numbers of the Farmers' Register.* To these, some addition might be made of some of those that have stood in the way of success, after the work had been undertaken.

First—these are an ignorance of some of the most common properties of water, and the laws which govern its motion.

Secondly—want of judgement in executing the work, is another obstacle. by producing ill success and discouragement. This is manifested frequently, (besides in various other ways) in taking a stream out of a very crooked channel, along the foot of the hill, and running it in one equally as crooked, along the margin of the opposite hill, for the sake of a lower place, and getting the land more in a body. It is evident that nothing is gained in this instance by the diversion of the stream, it being in a situation precisely similar to the one in which it was at first, and the land still subject to excess of water, on account of its width, for the want of a main drain passing through the middle. Sometimes an attempt is made to confine a stream by a shallow ditch, in this situation, and a high dyke, in a narrow passage, between the dyke and the hill. The consequence of this is, the water when a freshet occurs, on account of the narrowness of the passage, the hydrostatic pressure of the water (which is as we have already seen, as powerful laterally, as in any other direction,) and the crookedness of the channel, the water bursts through the dyke, over the land, and makes a joke of the vain and injudicious attempts of the drainer to confine it. Besides, the water here running nearly on the surface of the ground, (the hill and the dyke answering in the place of banks) it makes all the land adjoining the dyke, too wet for cultivation; and the channel after awhile, on account of the deficiency of "fall," will fill up with mud, and render the stream still more liable to overflow. Water is a dangerous element to trifle with, where you run counter to all its laws and properties—(as in this case,) but concur with these, and it is easily managed. When the floodgates are hoisted, and the freshets are high, if you then attempt to confine it in a shallow, level, crooked, and confined channel, "it will laugh at your calamity, and mock when your fear cometh," and the desolation of your crop, like a whirlwind. The ditch should be cut through the middle (if practicable,) of the land, for the sake of the fall, straightness of the channel, its depth, and higher banks, and to act as a main drain.

Thirdly—meeting with rock, is another obstruction; on the account of which, numberless undertakings have been abandoned, after much labor and expense. To avoid these, (which are apt to be met with, in hills and rising ground in the flat land) the stream should not be conducted too much out of its general straight course, which is the case when it is taken through ground much higher than the bed of the old channel, or is cut into the hill-side, when it meets with knolls, or little plats of rising ground. As they are generally of short extent, the new channel should not be curved to avoid them. In the ditch under consideration, mentioned above, there were several places of this description; but as they were small, and the rocks were detached, they offered no obstruction, except in one place, where the canal approached very near the foot of the hill, at the pond S, where the rocks which projected out of the hill, (which formed one bank of the ditch there) and run partly across the bed, were a little stratified; but they were easily removed, and the current has a sufficient passage.

Fourthly—the fear of losing too much land by the washing and caving of the ditch, is with many, an obstacle to ditching on a large scale. But it must be recollected that where we lose land in one place, it is counterbalanced by gaining it in another; for every foot washed away by the new channel, one is added on to the old, by the depositions of freshets, besides enabling you to till nearer the water, and the general acquisition of

*See communications *On Draining*, Nos. 7 and 12, Vol. I.

land by drainage, and the prevention of freshets.

Fifthly—even religious scruples, or rather superstitious notions, have troubled many upon this subject. They seem to think it sacrilegious to divert a stream from its ancient bed, where the Almighty has placed it, and put it into one entirely new. But let a flood occur that threatens total destruction to their crops, and they are perhaps the very first persons that lose their submission to an overruling providence. This spice of devotion to streams, is very ancient. I imagine, should any one attempt to change the bed of the sacred Ganges (as it is called,) all the pilgrims of the East, would be in arms against him; where they resort in "numbers numberless," to pay their superstitious homage to that watery god, and to sacrifice their offspring. Some may be surprised to hear that such an obstacle should exist to draining; but such is the fact: nor need we be surprised at it. Superstition has in all ages retarded, not a little, the progress of knowledge. The suggestion of Gregory, that the sun was fixed, and the earth revolved, was condemned as a heresy by the church, and the support of it provided a prison by the Inquisition, for Galileo. But we will not digress.

Sixthly, and lastly—the fear of incurring expense, has been the prime cause which has obstructed this kind of work. The work is begun, and a pretty good way is made into it, when all at once, it is abandoned. "Too expensive—it will cost more than the land is worth to finish it:" and thus all the labor is entirely lost. A little rock, perhaps, is found in the bottom of the ditch, and for fear of spending 40 or $50 to remove it, $400 in previous labor is entirely thrown away, and a great deal of land destroyed. How many undertakings of this sort, which either from want of judgement in the design, or from partial execution of the work, or from both causes, are every where to be met with, and remain the monuments either of the ignorance, or the penuriousness of the undertakers.

To do the work effectually, and profitably then, we must be determined to go through with it, cost what it may. If we first "count the cost," and find it likely to be profitable, if it cost half the worth of the land, or even the whole worth of the land, (that is what it would sell for before draining and reclaiming,) for it might increase the value of some land that was not worth five to twenty dollars, or even to fifty. Nothing is more expensive than the cultivation of wet, undrained land, (and whose crop is not pitched in a good portion of this sort every year?) and nothing more deceptious. The land has the appearance of being rich, and indeed it is, and we try it every year, though we are as often disappointed.

It is better to cultivate the most barren hills on your plantation, than the richest spots subject to excessive wetness; for they not only fail of a small produce, but they produce nothing at all, whereas the most barren hill will produce something. In fact, the "sobbed" parts of a plantation are the poorest parts on it, when permitted to lie undrained—but if thoroughly drained, the very richest. From the value of not more than a cent, they may be suddenly advanced to 20 or $30 per acre, or more. And the value of the crops lost from excessive wetness, for one or two years, would do the work effectually. Is it not profitable then, to lay such places dry if ditching is expensive? Where profits counterbalance expense, however great, there is no expense at all.

The straightening of a part of the channel of the stream, on which I reside, (Twittie's Creek,) by cutting the ditch exhibited in the figure, and an attentive operation of its observation for five or six years, has given rise to the foregoing remarks. If they can be of any benefit to any one having lands in a similar situation, the author of them will feel amply requited for his contribution.

N. E. READ.

From the Ohio Farmer.

THE FRUIT-DRIER.

Having found a fruit-drier a convenience in family economy, I am induced to give a short description of it, and its uses, *pro bono publico*. Take two boards 18 inches wide and 4 feet long, set them on end by the side of the house—on the top nail a cover, extending a little over the front, and leaving an inch open at the back, to allow the air to pass freely—make 10 or twelve drawers 3 feet long, 3 inches deep. The sides of common stuff, the bottoms of half inch stuff, split into narrow slits, and with brads fastened five-eighths of an inch from each other, so as to let the air pass freely; on these slats lay the fruit; the drawers may be taken out on sunny days, and in case of rain, and at night, they may be replaced. In this way the fruit is never moulded, and much labor is saved. The fruit requires no moving, and the drawers can be replaced with very little labor, and the drying goes on in rainy weather and at night.

From Loudon's Gardener's Magazine.

LIQUID MANURE.

Liquid manure may be here [at Ghent] named, and very justly so, their *summum bonum;* as if applied when the corn is sprouty, or just before a rain, it has an effect which no other manure can have. It destroys insects, and throws a surprising degree of vigor into the crops. It is pumped [from the tanks under ground, into which it is conducted by drains from the stables, &c.] into a barrel-shaped water cart; and, when brought upon the land, the plug is taken out, and the liquid, flowing over a board something in the shape of a fan, as the cart proceeds, is dispersed on both sides, over a space, perhaps, of 4 or 5 feet. The cart has generally three wheels.

From the Cultivator.

FENCE POSTS.

An excellent method of rendering these durable in the ground, is published in the American Eagle. It consists, 1. In peeling the posts, and in sawing and splitting them if too large; 2. In sticking them up, under cover, at least one entire summer; and 3. In coating with hot tar, about three feet of the butt ends, which are to be inserted in the ground—after which they are ready for use. We have no doubt the advantages of this mode of preparation will more than remunerate for labor and expense. Our reasons for this belief are brief-

ly as follows: The sap of all non-resinous trees, will ferment in the presence of heat and moisture, and cause the decay of the wood. To prevent this natural consequence, the first object should be, when a tree is felled, to expel the sap from the pores of the wood. This is done by peeling, splitting, sawing or hewing, and exposing the wood to the drying influence of the sun, or at least of the air. The process is facilitated too by immersing the wood in water for a time, which liquifies the sap, and favors its expulsion. And when the moisture has been expelled, the next object is to keep it out, by paint, tar or charring. In the mode recommended above, the moisture is expelled by the peeling, sawing and summer-drying, and its return is prevented by the coating of tar. The retention of the bark upon timber is particularly prejudicial, not only in preventing evaporation, but affording shelter to various species of the borer, which, under its cover, carry on their depredations upon the timber. We have seen pine logs nearly destroyed in a summer by worms, where the bark had been left on, while those which had been peeled remained uninjured. The best timber is obtained from trees which have stood a summer, or a year, after they have been girdled and peeled.

From the New York Farmer.

SAXONY SHEEP.

[The following is an extract from a reply to a paper republished in the Farmers' Register p. 45 Vol. III.

There is in Saxony a breed of sheep which were introduced and reared with great care by Augustus, Elector of Saxony and King of Poland, which, in commemoration of the introducer, have been called the electorial breed. I was brought up in that country to rural husbandry, particularly to the care and management of sheep, and perfectly acquainted with the purest and most celebrated flocks. From these I selected my sheep, and brought them to this country. They bore the fatigues of the voyage remarkably well, and arrived in safety. I sustained some little losses at first, from being a stranger to the peculiarities of the country, from having to hire my sheep kept, for want of suitable accommodations, and of such fodder as I wished. During the last eight years, and since I had a farm of my own, I have not lost over $1\frac{1}{2}$ per cent.: for the last year not more than 1 per cent. The last two winters I had no loss, and the last year I raised 101 lambs, from 100 ewes, one only of my eyes having twins. The sheep which R. speaks of do not shear more than $2\frac{1}{4}$lbs. My flock, last year, of 200 ewes and lambs, averaged 2 lbs. $6\frac{1}{2}$ oz. If I had had a proportion of wethers, they would probably have averaged 3 lbs. My grown bucks sheared $4\frac{1}{2}$ lbs. He says they (that is, the sheep he speaks of,) are poor nurses: my ewes are uncommonly good. All these facts can be abundantly proved from my sheep records, in which births and deaths, and every thing of importance, is recorded, and from credible witnesses. All these facts, in which there is no guessing, show conclusively that R.'s statements about the pure breeds of Saxon sheep did not allude to my sheep at all; and therefore I hope there will be no unkind feelings between us.

Respecting the "*miserable*" quality of the meat, if R. will produce the best sample of the South Down mutton he can find, I will meet him at any place he shall name with a sample from my Saxons; both shall be cooked in the same manner; he shall select one or more of the most accomplished connoisseurs in good eating, and I will rest that point on their decision.

I have but one little statement more to add, and I will then leave the subject to the public. The prices current of wool in New York, given in the Cultivator for the last month (May) are for Saxony, 80 cents; for half-blood 53 cents, and for native, 33 cents. Now, allow my ewes to produce $2\frac{3}{4}$ lbs., (and they will rather overgo than fall short of it,) then at 80 cents the fleece will bring $2 40. Allow the South down ewes to shear 4 lbs. and allow it be to equal to the half-blood merino, and the amount will be $2 12. Allow the Bakewell breed to produce 7 lbs., which is 1 lb. more than R. rates them; this at 33 cents will be $2 31. The three fleeces will stand thus:

Saxon,	2 40
South Downs,	2 12
Bakewell,	2 31

With these remarks, I submit the subject.

HENRY D. GROVE.

From the Farmer and Gardener.

DIRECTIONS FOR SOWING THE SEED AND RAISING THE PLANTS OF THE WHITE ITALIAN MULBERRY TREE.

1. To sow an ounce of seed, prepare a bed 50 feet long and 4 feet broad. Manure it well with a compost composed of $\frac{1}{3}$ stable manure, $\frac{1}{3}$ ashes, and $\frac{1}{3}$ decomposed leaves from the woods, or garden mould; dig deep, pulverize finely, and then lay the bed off in drills 12 inches apart, $\frac{1}{4}$ or $\frac{1}{2}$ of an inch deep; sow the seed as thick as you would onion or parsnips; cover with rich mould, press the mould down gently, but sufficiently to cause the seed to come into contact with the earth; and should the weather be dry, water the seed bed every other evening, it will assist in promoting the germination of the seed and vigorous growth of the plant.

2. Keep the beds clean of weeds; and should they receive an occasional watering with suds or soot and water, say once a week after they are up, if planted this month, August, they will be fit to transplant into nursery rows in April next, or if not desirable to be so removed, they may be permitted to remain until the ensuing spring, care being taken to keep the bed clean of weeds, the earth stirred, and watered in dry seasons.

3. The second year, if not removed before, the plants must be removed into the nursery rows, which must be prepared as for any other crop. The ragged roots being taken off and the tap root shortened, the plants must be planted out 12 inches apart in rows three feet apart, the earth to be well trodden around the plant. As before, the earth must be kept open and free from weeds.

4. At two years old, the plants may be planted out into hedges, at 18 inches apart in rows six feet wide. The ground should be prepared as before directed and some good rich mould put into the holes, to be pressed around the plant. If intended to be planted out as standard trees, 20 feet square

apart would be good distance; but in that case the plants should not be transplanted until they are about an inch in diameter. In either case they will require trimming and topping, and if kept as hedges should be treated as other hedges are.

ROBERT SINCLAIR, JR.

From the Salem Landmark.

PROFESSOR SILLIMAN'S SECOND LECTURE ON GEOLOGY, ABRIDGED.

Internal fire or Volcanoes.

The lecturer said it was a tremendous thought, that the centre of the earth was a vast mass of liquid boiling flame. But that it was so, was in the highest degree probable. He then glanced at the volcanic regions on the globe, beginning with Iceland, which is wholly volcanic, being the hottest and the coldest country in the world. He said it was well ascertained that Sweden was rising out of the water, at the rate of about four feet in a century; that is, the ocean is gradually receding from the shores of that country, as the water marks plainly indicate. This he supposed to be the expansion of that part of the crust of the earth, produced by the internal heat.

In England there are no volcanoes, and no evidence that there ever was any. But in the city of Bath there are heated waters which are known to have existed in their present state for more than two thousand years. These waters can be heated only by internal fires.

In France there is a series of extinct volcanoes along the borders of the Rhine. They are also to be found in Spain and in Portugal, in Italy and in the islands of the Mediterranean. A volcanic island emerged from this sea about four years ago. There is, therefore, reason to believe it reposes on a bed of fire. There is abundant evidence that volcanoes have been in Palestine; the last probably were those connected with the destruction of Sodom and Gomorrah. They are clearly traced around the Caspian Sea, and in the centre of Asia.

In the Azores, the existence of forty volcanoes is discoverable. So likewise they are found in the Madeira, the Canary, and the De Verde Islands, in Madagascar, Bourbon, along the Red Sea, in Sumatra, Java, Kamschatka, and on the north west coast of America. Mexico is a peculiar volcanic region, and so is the whole western side of South America. They have not existed on the eastern side. Sufficient relief has thus far been had on the western coast, but should these safety valves be obstructed for any length of time, very probably there would be volcanoes on the eastern coast.

The Pacific Ocean to a very great extent stands upon a basis of fire. There are on the globe three hundred chimneys, through which the fire can escape from its prison in the centre of the earth. Volcanoes are very justly denominated safety-valves, the conservative principles of our globe.

The invariable precursor of a volcano is an earthquake, generally attended with loud detonations. Chasms are opened in the earth, and sometimes cities are swallowed up. Changes in the atmosphere are also visible. The seasons are irregular; animals utter cries of alarm; dizziness of the head is experienced by men.

The waters of the Ohio were affected by the earthquake at Lisbon. In the eruption of a volcano, rocks are dashed against each other, and either ground into powder, or broken into fragments. White smoke first emerges from the crater, then black, rising like the trunk of a tree.

The most remarkable volcano on the globe is in the island of Hawaii, one of the Sandwich group. This has been visited and scientifically examined and described by the American Missionaries, to whom Mr. Silliman awarded high praise, not only for their christian zeal but for attainments in science and literature. Science as well as christianity is under obligation to them for their devotedness and enterprize.

The cause of volcanoes is internal fire. That it exists, there is very satisfactory evidence.—There is a gradual increase of heat as we descend into the interior of the earth. At two miles below the surface, water will boil; at ten miles below, rocks become red hot. The frozen [or solid] crust of the globe is supposed to be about forty miles thick. We cannot be perfectly secure against the effects of this fire. The crust of the earth is at any time liable to be broken. Our security and dependence are upon Him who made the world, who gave to matter all its laws, and who controls its wonderful movements.

The sun is a body of fire, occasionally exhibiting dark spots on its surface. Mr. Silliman suggested those spots might be produced by the formation of a freezing crust like this which covers our globe. If so, the time may come when the sun shall all be frozen over, and there shall be no more light or heat to cheer or warm this solar system. For the consolation of this audience, he said they would not be here when such an event should happen.

For the Farmers' Register.

ACCOUNT OF MARLING LABORS, EXECUTED UNDER GREAT DISADVANTAGES.

When any laborious or expensive improvement or process is referred to as worthy of imitation, and as promising profit to those who possess (and neglect) the means for like operations, it is very common to hear it said in reply, and with an air of triumph, as if the reply was quite conclusive—"Oh! Mr. —— has plenty of money: that's the whole secret. Give *me* the like means, and *I* could do as great things." So far from this being true, there are very few farmers whose means are scanty, and who fail altogether to improve their lands, or their practice, who would not be found as deficient, if their wealth was increased to any extent. No one will deny the great advantage of capital, in facilitating improvements: but still it may be asserted, that where there is no profitable improvement without surplus funds, there would be none with any amount of them whatever. The common remark quoted above, is applied as often as in any other way to marling; though numerous facts, as well as reason, are ready to contradict its truth. There are very few new improvements in agriculture that are made early use of by poor farmers—either from the slowness with which information reaches them, or because the eventual profit is not so certain as the expense. But with marling, at least on the south side of James River, it has been remarkable that many poor farmers have engaged in it earlier than many of the rich, and (in propor-

tion to their respective means,) have performed much greater labors. It matters not how laborious an improvement may be, if its profits are sufficiently sure and speedy—and that such are the returns from marling is sufficiently proved by the labors of such persons as are referred to—though unfortunately, for want of proper knowledge, much more than for want of capital, their efforts have seldom been well directed, and have therefore failed in reaching their full and proper share of reward.

One of the most striking cases of this kind is presented in the facts which it is the design of this paper to communicate. These are obtained from Edward A. Marks, Esq. of Burley, Prince George, who at the request of the writer, took pains to obtain, and to make written memoranda, of all the facts which his own means of observation had not previously supplied—and whose close neighborhood, and business as a farmer engaged successfully in like operations, gave him every facility to obtain correct information.

The father of the individual whose labors will be stated, left at his death a tract of very poor land, amounting to about 200 acres, which according to law, was divided in portions of equal value, among his eleven children. The widow's third for life, was, as usual, laid off around the dwelling, and embraced nearly the whole of the cleared land. As is also most usual, the shares to be given into the immediate possession of the legatees, were useless to all of them: but more fortunate than most persons in the like situation, they were enabled to sell out their respective shares to one person, at a full price, but not without being compelled by law, to pay a lawyer's fee, and other legal expenses, to obtain a decree of the court for the sale. Such is the *penalty* which our law then imposed, and though moderated, still imposes on all who are required both by public and private interest to sell rather than retain small shares of land, unfit to support their owners.

The eldest son, Mr. John Moore, bought in all the other shares, on a credit, and executed bonds for $24 for each. The purchase included the right to the reversion of the widow's dower, to be received after her death.

Low as this price may appear, it was more than enough for the value of the land, considered with a view to cultivation, as both the cleared and the wood land were too poor to promise any clear profit on the expense of cultivation, even supposing the clearing of the latter to cost nothing. This is however precisely the situation of many who till the poor ridge lands of this county, and who neither improve, nor can expect to improve the small rate of return for their labors. The wood land in question, was well timbered—and this, more than the crops to be obtained by cultivation, was the resource counted on by Mr. Moore, like all other proprietors of similar lands. But Petersburg was his principal market, and his staves, shingles, laths, and other light timber, had to be drawn in his single-horse cart sixteen miles, and the usual price of a load would scarcely pay ordinary wages for the actual time and labor employed in getting the timber, and conveying it to market. Still, unremitting labor made him thrive on this miserable business: which is only to be accounted for by considering that every hour which most others equally necessitous would have given to idleness, or search of pleasure, he devoted to labor—and that small as the returns were, all of them were saved, and judiciously used. Some of his heavy timber could be sold as it stood—but this was rare, and he had neither the necessary money, (& the boldness to risk more debt,) to hire labor, &c., to go largely upon sawing building timber for sale.

While engaged in this laborious course, gradually clearing and extending his cultivation, and as gradually paying his bonds, he first witnessed, on the lands of his neighbors, the effects of marling, and became desirous of obtaining similar benefit. He had no marl on his land—and though his neighbors would freely give the use of their beds, the distance remained a great obstacle. Not discouraged by this, as most richer men would have been, he began marling in the autumn of 1826. His whole force then consisted of his two sons, one 12 and the other 10 years old, himself, and one excellent horse. He never owned a slave. At a later time, and on some few and special occasions, he also hired a man to assist his labor for short periods. During all this time, and until his death, Mr. Moore drove his cart to Petersburg with a load of timber about once a week. Of course, his marling was only carried on at such times as could be spared from his necessary labors of timber getting and selling, and of cultivation. In stating his force, it is but fair to add a part, which, though not of much use in out-door labors, has an important bearing on every man's means of living—and in no case was the benefit greater than this. Mr. Moore's wife and two daughters were patterns of industry, and no doubt greatly increased the gains of his honorable labor and economy.

Mr. Marks does not pretend to state how much space was marled in any one year—but from a view of, and familiar acquaintance with the whole body of land, he is sure that in the eight years, during which the labor was irregularly carried on, that the space covered was more than 75 acres. The distance was never less than 800 yards—and the greatest was 1900, by supposition.

The marl used in 1826, was on the land of Josiah M. Jordan. The pit was very wet, and the labor greatly increased by the flow of water; and the marl had to be thrown up about six feet to the place where the cart could stand to be loaded. The marl was rich.

In 1827, marl was obtained (and always afterwards) from Mr. Marks' land, Burley, which had been postponed until then by the owner's being previously under age, and the scruples of his guardian as to giving permission. Since then, Mr. Marks has had as full opportunity of being acquainted with his neighbor's marling, as with his own, both being from the same locality, and generally from the same pits.

In 1827, the marl used by Mr. Moore, was dry, and of good strength, but hard to dig; and he had a steep hill to ascend, for want of a suitable road being cut. The rate aimed at was 350 bushels to the acre, and it was more often exceeded than fallen short of.

In 1828, there was about three feet of over-lying earth to remove, to get from below it a thickness of four and a half feet of marl. No other change.

In 1829, a one-ox cart was added to the hauling force—that carrying three and a half bushels of

marl—the horse loads five bushels. The covering earth removed was more than five feet thick, and five and a half feet of marl was got out.

In 1830 a good road out of the ravine, and up the hill, had been made by Mr. Marks, suitable for his own marling, and this Mr. Moore afterwards used instead of his previous steeper ascent. A pair of small oxen was now used instead of the single ox.

In 1831, the work was changed to a pit of marl of inferior quality, wet, and more difficult to dig. The quantity was increased to 400 bushels the acre. The youngest son this year was so much injured by a fall, as to remain an invalid as long as his father lived; and the little labor which he was able afterwards to perform, was not any thing like a compensation for his support. On this account, a white man was hired for about nine months of this year.

In 1832, two single horse carts were used, the lame youth driving one by riding. The wet pits were worked in dry weather, and when wet, the dry bank. The average cover of earth five and a half feet, and the marl obtained about the same thickness.

No change occurred in 1833. In 1834, no marling was done, as before the usual leisure time of the year had arrived, the death of Mr. Moore occurred. He was attacked by the new and fatal disease of our country, cholera, when returning from Petersburg, and would have died on the road, but for being found and carried by a friend, to breathe his last at home. He had been to carry the last of his crop of wheat to market, and the price which he brought back, sufficed to pay off the last of the bonds due for his land, then almost doubled in amount by the accumulation of interest.

A few years before his death he had purchased the life interest of his father's widow, in her dower land (exclusive of the building.) For want of means to keep the land fenced, it had previously been thrown out of cultivation, and had remained a common range for the cattle of the neighborhood, and yielded no profit whatever to the possessor. This is one of the many cases in which land holders, and especially widows, (as life owners,) are robbed of the whole income which their land would yield, by the operation of the law of enclosures—which law, notwithstanding, is upheld in argument, and in practice, as peculiarly beneficial to the poor. The widow was glad to accept three barrels of corn annually, for more than fifty acres of cleared land, which was yielding her nothing. Mr. Moore had marled about fifteen acres of this after his purchase, and had cultivated part of the land one year before he died.

It would be a source of much gratification, if when thus recording the facts of so uncommon an amount of labor and expense having been incurred by a very poor man to improve his land, it could be also stated that his labors were judiciously applied, and met with a proper share of reward. But this end was but imperfectly reached. The effects of marling seen on his neighbors' lands were sufficient to induce Mr. Moore to commence this great labor—and the effects which he derived from his own applications were such as satisfied him on the score of profit, and caused him to persevere with increasing energy to the last. But his land was at first vilely poor—and even when doubled in product by marl, was still poor. He had before (as is the common practice on such land,) taken a crop of corn from each of his two fields, every second year, and left the land to rest the intervening year. After marling, the land was immediately fit for wheat, and (being quite stiff,) even more fit for that crop than for corn. This tempted him to take a crop of wheat in what was before the year of rest, and thus there was a grain crop every year—and besides, the land was grazed bare between the wheat harvest, and the next winter's ploughing for corn. He was warned by some of his neighbors, who had better means to know the theory of the operation of marl, that his course would prevent the manure giving half its benefit, and would in fact make it the means of destroying the little stock of natural productiveness which his land possessed. He was perhaps incredulous as to what was so opposed to his previous opinions of other manure—and his scarcity of cleared land, and necessities, urged him to this improper, and indeed, destructive course—in which however, he did no worse than many others who have not the same excuse, of wanting land, money, or means of being informed. Under these circumstances, it is not strange that the land marled shows but little of the productiveness which different treatment would have insured, and which has been obtained elsewhere.

But however much this result is to be lamented, it in no manner impairs the value of the lesson taught by the labors of John Moore—which is, that extensive and valuable improvements by marling may be made by farmers who are placed under the most disadvantageous circumstances, as to want of capital and labor, and without any of the facilities which are commonly supposed indispensable to encourage and aid such undertakings. There was not only the absence of spare capital, spare labor, and spare time—but the continued presence and pressure of privation and of debt. Above all—there was the want of information, and of any existing mode of general communication amongst farmers, which would have served to make known this man's meritorious efforts, and brought to him that applause and encouragement which he so well deserved, and the information and aid which he needed. His efforts were scarcely heard of, except by his nearest neighbors—and except the gift of the marl, he had no aid of any kind. It was unfortunate for John Moore that this want of means for intercourse among farmers should then have existed: it is not less so for the community, that for the same reason, his praiseworthy exertions should have been permitted to be spent almost in vain. To make known such efforts, to direct, and to encourage them, would be among the most useful operations of agricultural journals, and agricultural societies: and by such a course, they would promote the public interest in a far more important degree, than that of the particular individuals whose merits and necessities would deserve their attention and aid.

E. R.

From the Tennessee Farmer.

ON MAKING MEADOW.

In the upper part of East Tennessee, the following course will be found the most advantage-

ous mode of making a new meadow, where the land is not very foul. Let the land be cleared by grubbing it well, and taking off all the timber by the first of August, then rake up the leaves, chips, &c. and burn them; after which harrow the ground repeatedly, until the weeds and grass are completely destroyed, and the soil on the surface well pulverised, then sow turnip seed and harrow it again, after which sow timothy seed thickly, and brush the land over with a light brush. The bottom will thus be smooth, the turnips and timothy will both do better than if the land had been ploughed, and the latter particularly, will be far better set, and endure much longer. By breaking up the land, the roots, will be broken, and much labor rendered necessary to remove them, so as to prevent obstructions to the scythe, while the grass, instead of being benefited, will be greatly injured by the ploughing. Take care to sow the grass seed thick, sowing one-half the seed in lands in one direction, and the other half in lands crossing the first, so that the seed may be as evenly distributed as possible. By this means, the first crop of hay will be found to be as good and as clean, as any succeeding one. It is a very common, but a most injudicious practice, to break up the land with the plough, by which the grass is not only injured, but in spite of all the care which can be taken, snags, or pieces of the roots, will be left standing up, well calculated to break scythes and to obstruct the mowing. A false economy also, is too often resorted to, of sowing too little seed, depending on the ground to seed itself from the first crop: the consequence is, that the weeds spring up in such abundance, as to render the first crop of grass of little or no value, and the land is moreover rendered so foul, that in a short time, it will be necessary to plough up the meadow, whereas, by a liberal application of seed in the first instance, the first crop of hay would have been clean and valuable, and much of the filth smothered by the grass. This mode of seeding highland meadow here recommended, has been repeatedly tried by the editor with uniform success. Whether it would answer as well on the more sandy soil of the western part of East Tennessee, unless in favorable seasons, is doubtful; but if the turnips be dispensed with, and the timothy seed be sown late in the fall, or in the winter, he has no doubt it would prove equally beneficial in those soils. If old land is to be converted into meadow, after ploughing and well harrowing the ground, the seed should be sown liberally as before stated, and the roller run over the land once or twice immediately after sowing, and again in the succeeding winter or spring, while the ground is tolerably dry. When the meadow begins to fail, let the seed become perfectly ripe before mowing, immediately after, harrow well with a large harrow, and if practicable, apply a dressing of manure. The meadow will thus be renovated, and again yield fine crops of clean hay. It must not however be forgotten, that timothy is an exhausting crop, and that therefore, to render a meadow of this grass permanently productive, it must be aided by occasional applications of manure. If the land be wet, a mixture of the seed of the herds grass or red top, will be very advantageous. If the land be very soft, or even miry, the herds grass alone should be sown, and it will form a most valuable and durable meadow. We must caution our readers however, if they wish to preserve good meadows, to avoid excessive grazing on them, and particularly, not to permit stock to run on them while the ground is soft. This destructive practice so common amongst us, is more injurious to our meadows than all other causes combined. It is one of the many instances of false economy to be met with in our agricultural practices, by which pounds are sacrificed to save pence. A meadow should by no means be pastured in the winter or spring.

From the *Code of Agriculture* of the 5th Edition, 1832.

ON THE MEANS OF PREVENTING THE RAVAGES OF 1. SLUGS; 2. GRUBS; 3. THE WIRE-WORM; AND 4. THE WHEAT FLY, (OR TIPULA TRITICI,) ON OUR CROPS OF WHEAT.

Among the various difficulties with which a farmer has to contend, in raising his crops, the ravages committed by a variety of the more diminutive tribes of animals, are much more important, and carried to a far greater extent, than is generally apprehended. These vermin are of several sorts; but the principal are, 1. Slugs;—2. Grubs, or large maggots;—3. The wire-worm;—and 4. The wheat-fly. The three former devour the plant when young; the latter attack the ear when it is coming to maturity.*

It is proposed to give a short account of the various measures hitherto adopted, for preventing the injuries to which our crops of wheat are liable from these destructive animals, accompanied by any recent suggestions for that purpose.

1. *Slugs.*—These are properly "naked snails." They abound in spring, but only appear early in the morning, and late in the evening, more especially when the weather is warm. In the day time, they destroy the roots, and in the night, the blades, and other parts of the young wheat which they find above ground. They deposite their eggs in the earth. Powdered salt, saltpetre, and quicklime, are destructive to slugs; but lime-water is the most effectual, the least drop of it killing them. For that purpose, some diligent farmers collect by means of pea-haulm, under which they shelter themselves, and they are then destroyed by a watering pot, by means of which, lime-water is sprinkled over them, when the haulm is removed. Sulphuric acid, even diluted, would probably answer the same purpose. Rolling the ground at night, or treading the surface with sheep, &c. are useful practices for the destruction of this species of vermin.

2. *Grubs.*—These are worms or maggots produced from the eggs of beetles, which ultimately are transformed into winged insects of the same species as their parent. They are likewise called "the rook worm," rooks being so fond of them.

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* Fields of wheat sometimes appear blighted early in the spring, by a small insect of the grub or caterpillar kind, lodged in the centre, or very heart of the stem, just above the root, but the plants afterwards recover, and shoot afresh. The insect is called the *musca pumilionis* by Linnæus, from its effects on rye, on which it chiefly feeds in Sweden, rendering the plants it attacks dwarfs. Annals of Agriculture, vol. xvi. p. 170; Trans. Linn. Soc. vol. ii. p. 76.

They do great injury to the crops of grain, by underminding and feeding upon the roots of the plants. They are hardy in their egg state, and, when grubs, are invulnerable to the weather; but when passing from the aurelia state, rain and cold weather will destroy them. This maggot is so destructive, that if every season were equally favorable to its production, it would soon render the world a desert.

Various remedies have been recommended for destroying them, in particular, sowing salt with the seed—strewing barley chaff on the surface, so as to entangle and destroy them—spreading quicklime, or saltpetre over the field, before the plants get up—employing ducks to devour them—rolling the earth, more especially during the night, when the grubs are generally on the surface—and treading the surface with sheep or pigs, and sometimes even with horses.

3. *The Wire-worm.*—This is a noxious animal, abounding both in old grass-lands, and in clover leys. It is very difficult to destroy them, as they are peculiarly tenacious of life. For five years, the wire-worm remains inhabiting the earth, till it changes its nature, and becomes a winged fly, (the Elator segetis of Linnæus.*) Some recommend, as the surest and most effectual means to get rid of them in old grass lands, to pare and burn the surface. Others suggest the sowing of spring instead of winter wheat, on the idea that the culture, at that season of the year, would destroy them. A plan has recently been suggested by Mr. Radcliffe, an intelligent clergyman in Ireland, of paring the surface of old leys—accumulating it in great heaps in the fields, and planting the field, and even the heaps with potatoes. By this means, a valuable crop is raised—the destruction of the wire-worm is insured—and an immense quantity of valuable earth, full of rich substances, is obtained. Another effectual mode of destroying the wire-worm is to plough the clover stubble in July, as soon as the crop of hay is taken off, or the land has been cut for soiling, and then to sow it with cole seed, on one furrow, to be eaten down by sheep. The treading of the sheep will effectually destroy the worm, and the wheat may be sown with safety in November. But the simplest mode of destroying wire-worms is to delay ploughing till December; for if the land is then ploughed, they would be exposed, in a torpid state, to the frost, and the inclemency of the season.

That the reader may be induced, to pay more attention to this branch of the inquiry, it may be proper to state, that according to the most accurate calculation that has hitherto been made on the subject, no less a quantity than 60,000 acres of wheat *in England alone*, are annually, either greatly affected, or completely destroyed, by this noxious animal.†

4. *The Wheat Fly.*—But of all the injuries to which wheat is liable, perhaps there is none more to be dreaded, or which is likely to be more severely felt, than that which is occasioned by a species of the fly, whose depredations have been felt in other countries, as France, and America, as well as Great Britain.*

1. *France.*—The depredations of insects in the district called the *Angoumois* in France, are well known. They began their ravages in one peculiar canton. They successively spread through the whole of that district, and afterwards penetrated into the neighboring provinces, particularly those which had any settled intercourse in corn with the Angoumois. Grains that have appeared quite perfect, have each contained one caterpillar. This is soon transformed into a butterfly, which becomes the stock of an innumerable line of caterpillars. It is thus that so deplorable a calamity spreads so quickly. But it requires a combination of several causes, (which fortunately does not happen very frequently,) to favor the increase of these little animals, otherwise they would soon overrun any kingdom, and destroy the food of its inhabitants.†

2. *America.*—The celebrated Hessian fly in America, is another insect of the destructive effects of insects. It got the name of *The Hessian Fly*, because it was supposed to have been brought over in the straw-beds and baggage of the Hessian troops employed in the American war, who were first landed, an. 1776, in Staten Island and the west end of Long Island. It was there where the insect first made its appearance, and thence it spread into the southern district of New York, part of Connecticut, and Jersey. In the countries which it ravaged, the destructive powers of this insect are represented as in the highest degree alarming. In some districts, it is said to have so entirely cut off the produce, "that able farmers had not got at harvest a sufficient quantity of wheat for domestic uses, and, indeed, that they sometimes failed to reap the amount of the seed they had sown."‡ During the period that the Hessian fly was so celebrated for the mischief it occasioned, the government of this country, prevented the introduction of wheat from America. Such precautions are not useless. The Egyptian bean has an insect in it *of considerable* magnitude, which completely devours the kernel of the bean before it becomes visible. This species of bean has been raised in some parts of England, and the same insect is produced. Some means should be adopted, to prevent the dissemination of so pernicious a production, otherwise the public will sustain a very considerable injury, which, by wise precautions, may be prevented. Any risk of this mischief spreading might have been prevented, had a public institution existed, to warn the farmer of his danger from its dissemination.

In the years 1787 and 1788, the greater part of the southern provinces of America, were infested

*See Trans. of the Linnæan Society, vol. ix. p. 160.

† See Trans. of the Linnæan Society, vol. ix. p. 158.

* A valuable paper on the wire-worm will be found in the Stockholm Transactions for the year 1777.

† M. de Hamel du Monceau has written a work, entitled, "Histoire d'un Insecte qui devore les grains de l'Angoumois, avec les moyens que l'on peut employer pour le detruire." Paris, 1762, 514 pages in 12 mo. This work details the advantages of all the methods hitherto proposed, for preventing the ravages of weevils, moths, and every other species of vermin that attack corn.

‡ See Malcolm's Survey of Surry, vol. ii. p. 258, on the authority of Dr. Mitchell of America.

with another insect, called there the "*Flying Weevil*," which, when full grown, is a minute moth, somewhat resembling that which breeds in, and destroys woollen clothes. This insect is unfortunately well known in Europe as well as America. In fact, it seems to be the same insect that is called "The Wheat Fly" in this country, and which has recently been so destructive in several districts.

3. *Great Britain*.—The mischief done by the wheat-fly in various parts of the kingdom, in the course of the year 1829, and the two preceding years, is frightful to contemplate. In one district in Scotland, (the Carse of Gowrie, in Perthshire,) the destruction it occasioned was estimated at little short of forty thousand pounds.* In many cases, the crop was not worth the cutting down; and in other instances a fourth, a third, or even a half of the produce was destroyed. The myriads of this vermin, and the facility with which they fly from one field to another, in search of the plants in which their eggs can be safely and efficaciously deposited, seem to place their depredations beyond the powers of man to control; and hence it has been asserted, that the only means of avoiding the mischief is, either to give up the culture of wheat until the race is destroyed, by the want of the plants necessary for continuing the species, or by patiently waiting, until seasons destructive to them naturally occur. If Providence however, has created so destructive an insect, as the *tipula tritici*, or wheat-fly, it has been no less attentive, to prevent its becoming too numerous, by making it the food of other insects. Indeed, there are no less than three *ichneumons*† who seem to be intrusted with the important office of restraining, within due limits, the numbers of this destructive species, otherwise it would become too numerous to be subdued. The most extraordinary circumstance is, that one species of these ichneumons lays an egg near the egg of the fly. They are hatched at the same time; and it is ascertained, that the maggot from the egg of the ichneumon, either lays its egg in the body of the caterpillar, when it can get at it, or devours the maggot, and thus preserves the wheat from its attacks.‡

It is not here proposed, to enter into any philosophical discussion regarding the origin of the wheat-fly. It is sufficient to remark, that in the spring, and in the beginning of the summer, a species of fly is frequently found, in great numbers, which attaches itself to the heads of wheat, when the ear begins to appear, and where it deposites its eggs, which in about ten days after they are placed in the ears, become maggots or caterpillars. These destroy the young pickle, by sucking up the milky juice which swells the grain, and thus, depriving it of part, and in some cases perhaps the whole of its moisture, cause it to shrink up, and so to become, what in the western parts of England is called *pungled*.§ In about three weeks after, when it has exhausted this substance, it drops upon the ground, where it shelters itself at the depth of about half an inch from the surface. There it remains in a dormant state, until the mean temperature is about 50°, when, vivified by the warmth of spring, it becomes a fly, about the time that the wheat produces the ear.

It is evident, that the same plan, that in our climate has been found so effectual for destroying the wire-worm, would be equally destructive to the wheat-fly, namely, that of leaving the soil which has produced the wheat untouched till November, and then exposing it to the inclemency of the weather, and in particular to the action of frost.

The great difficulty attending this plan is, to devise an advantageous course of crops, consistent with the idea of putting off the ploughing of the wheat stubble till November or spring. In the celebrated four years' rotation, 1. Turnips, 2. Barley, 3. Clover, 4. Wheat, the wheat stubble, as a preparation for the turnip crop, might first be ploughed shallow, and then a deeper furrow taken, by which the fly would be buried,* scarifying and ploughing at the same time, and ploughing shallow in spring.

I scarcely think it possible, that the fly can be destroyed, if the wheat is succeeded by clover, unless, perhaps, by severe rolling and treading.† The minuteness of the caterpillar, which is no bigger than the ordinary roman letter C, will preserve it in a great measure from the effects of pressure.

It is a great advantage attending any plan for the general destruction of this vermin, that the young embryos are in general deposited in the fields "where the wheat grew."‡ Under a proper system, therefore, the race might in a great measure be extirpated in any particular district. It is absolutely necessary however, that there should be a general combination for that purpose. Nothing done in the field where the new wheat is sown, can be of any use, for the fly is produced in fields, not under wheat at the time, and flies about, until it finds a plant suitable for its purpose.

In seasons, when the frost may not be supposed sufficiently violent, the desirable object may be obtained, by frequently stirring the ground, and by rolling and treading it, or burning stubble upon the surface, or by the use of hot-lime. Fumigations of tobacco or sulphur, made when the wind is favorable, might also render the ear disagreeable to this insect.§

If other means are ineffectual, surrounding the field of wheat with a belt of hemp, the smell of

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* Mr. Gorrie, an eminent gardener in the Carse, calculates it at £36,000.

† Trans. of the Linnæan Society, vol. v. p. 102, where they are described by Mr. Kerby.

‡ See this interesting fact explained in the Quarterly Journal of Agriculture, published by the Highland Society, No. 5, p. 301.

§ See Transactions of the Linnæan Society, vol. iii. p. 302,

* This is a plan recommended by Mr. Gorrie in the Carse of Gowrie.

† An instrument, at the same time, might be invented, similar in principal to the machine used at bleachfields for beating linen, which would probably destroy the maggots of the wheat-fly in the young clover by compression.

‡ Mr. Sheriff has ascertained, that embryos are likewise deposited in the *triticum repens*, or couch grass, which delights to grow in hedges, and other neglected situations; but these could easily be extirpated.

§ Transactions of the Linnæan Society, vol. v. p. 105.

which is so peculiarly noxious to insects, might be tried.* The smoke of burnt weeds, and in particular of *sea weeds*, might also be of use.

In the course of these inquiries, I have seen very strong assertions, made of the benefical effects of *elder*, in protecting growing plants from the attacks of insects; in proof of which it is said, that when a whole district was infested with cock-chafers, and scarcely a green leaf was untouched, the elder alone remained uninjured. This plant is said, 1. To preserve cabbages from being injured by caterpillars; 2. To prevent blights and other effects on fruit and other trees; 3. To protect crops of wheat from destructive insects; and, 4. To prevent the destruction of turnips, by the fly, if elder bushes are drawn, for that purpose, along turnip drills.

It is recommended, to beat the cabbages with twigs of elder, or to make a strong infusion of elder water, and sprinkle it over the plants with a watering pot.

It has been remarked, that the greatest mischief is usually done to the late sown wheats, and that such as are sown early, receive little or no injury. When the grain has arrived at a certain degree of hardness and consistency, (which may be the case, with the early sown wheats, before the insect has made any material progress, or even commenced its operations,) the plant is not so liable to be injured.

Conclusion.

It is much to be lamented, that so important an object as the means of preventing the destruction of our most valuable crops of grain, should not have attracted the attention of government; by whose means, discoveries might be made, which can never be expected from private exertions. By public encouragement, the inquiry would be carried on with energy, and probed to the bottom; and the most effectual means of preventing the mischief, would probably be ascertained. What subject can be compared to it in point of importance? At present, we are liable every year, not only to the loss of some millions worth of grain, but to all the mischiefs of scarcity, and even of famine. These would not probably be experienced in this country, were the ravages of insects, and the destruction by the mildew† prevented; objects which are certainly in a great measure attainable, if the inquiries regarding them were prosecuted with vigor, and if no expense were spared in collecting facts, and ascertaining, by careful experiments, the means by which such frightful losses might be prevented.

* It may be proper here to mention a curious fact recorded in the Survey of the Hebrides. A cottager there, had his cabbages much injured by the caterpillar. He surrounded his little garden *with hemp*, and was no more molested by them, the smell of that plant being noxious to insects. The same idea exists in France, as appears from the following paragraph: "Quelques personnes ont cru reconnaître, qu'en semant du chanvre sur toutes les bordures d'un terrain, les chenilles n'ont point dépassé cette barrière, quoiqu'elles infestassent tout le voisinage." *Code of Agriculture*, 4th edit. p. 523, note.

† The writer of this paper, from his zeal to promote the improvement of British Agriculture, was led personally to examine the husbandry of the Netherlands. He there found, that "*The Rust*" or mildew, which frequently occasions such devastation to the crops of wheat in England, was scarcely known. He prevailed on the Board of Agriculture, to offer premiums for the best accounts of Flemish husbandry; and regarding that point in particular, several valuable papers were sent over; but unfortunately, about the time they arrived; government had resolved to abolish the Board, and actually sent all the papers belonging to that institution, (and these most valuable documents among the rest,) *to the Tower of London*, where they still remain, carefully locked up, as if information that might prevent the miseries of scarcity or famine was unfit to be promulgated, and should be carefully concealed from the public eye.

SEED OF THE BREAD-FRUIT TREE.

To the Editor of the Farmers' Register.

I send you by my friend ——, a few, of a few, seeds of the celebrated "*bread-fruit.*" In its native climate, it continues in use for eight months, and so various are the messes made of it by the Otaheitans, that Capt. Cook was led to say of it, "if in those parts where it is not spontaneously produced, a man plant but ten acres in his whole life time, he will as completely fulfil his duty to his own, and to future generations, as the nature of our less temperate climate can do by ploughing in the cold of winter, and reaping in the summer's heat, as often as these seasons return, even if after he has procured bread for his present household, he would convert the surplus into money, and lay it up for his children." Not only does this fruit supply food, but clothing, and numerous other conveniencies of life. It was for the purpose of transplanting the bread-fruit tree to the West Indies, in a growing state, that his majesty's ship, the Bounty, was despatched in 1787, to the South Seas, under command of Lieutenant, afterwards Admiral Bligh.

I send you also a few locks of long glossy and silk-like looking wool, from the skin of the famous Angora goat, sent to me from Constantinople, by the gallant and intellectual Porter—one of those rare spirits, who here and there rise aloft by their courage, enterprise, and talents, to illustrate their country, as do "cloud-capt towers" to embellish a city.

For the bread-fruit, should these seeds produce it, as they may in our southernmost region, the country will be indebted to Mr. Norris, a very young gentleman, who is much to be commended for his thoughtfulness in bringing them. For acts of less apparent national utility, some men have gained enviable immortality: for after all, what so deservedly confers immortality as the consideration of having added one more to the means of national subsistence and comfort.

J. S. SKINNER.

Baltimore, July 30, 1835.

It is believed that the best disposition has been made of the few seeds which were enclosed in the foregoing letter, by placing them in the care of two gentlemen of the South, to whom this journal and its readers are under many obligations. Our thanks for the gift, are due to our esteemed correspondent.

From the *Code of Agriculture*, of the 5th Edition, 1832.

ON THE ROTATION OF CROPS ON THE ESTATE OF HOLKHAM, BY FRANCIS BLAIKIE, ESQ.

When an account is given, of the rotation of crops in any particular estate or district, it is proper, that the soil and situation should be described at the same time, so that the reader may be better enabled to judge of the propriety of the system. For instance, upon Mr. Coke's estate in West Norfolk, which is celebrated for its good husbandry, the soil varies from light dry sand, to strong loam, retentive of wet. But the greater part of the land is a friable sandy loam, naturally poor, but very productive, from being kept in a high state of cultivation. The subsoil of the whole district is calcareous, and is called clay, marl, or chalk, according to its texture.

First Rotation.

The best, or first class of this land, is cultivated, either upon the four course shift, or upon the four and six courses alternately, as follows:

The Four Course Shift.—1. Turnips well manured, and part of the crop eaten upon the ground, or turnips and mangle wurzel, ("field beet,") in alternate ridges of four or more drills; the beet all drawn off, and consumed in the yards—and turnips eaten upon the ground;—2. Barley;—3. Red clover, mown once;—the second crop folded, and eaten off by sheep—a fresh piece being set out every day;—4. Wheat.

The Six Course Shift.—1. Turnips well manured and part eaten on the ground;—2. Barley;—3. White clover and mixed seeds, mown once;—4. Pasture;—5. Peas;—6. Wheat with manure. Thus, in the ten years, the land received three dressings of manure, exclusive of the sheep-fold; and produced two crops of turnips, two of barley, two of wheat, one of peas, one of clover hay, one of mixed grass hay, and one year's pasture. The four or six course shifts, taken alternately, are preferable to a constant repetition of four course husbandry, and should be adopted, whenever a convenient opportunity occurs.

To a person unacquainted with the management of light arable land, and the use of rape cake, it will appear, that the three dressings of manure here mentioned, exclusive of the sheep-fold, are extraordinary high farming. But when the expense, and speedy application of the manure are pointed out, the wonder ceases. Thus, the average price of rape cake, including the expense of breaking the same into a powdered state, has, in the last ten years, been about 5£ 10s. a ton, and that quantity is usually allowed to three acres of land; and suppose rape cake manure only is used, and three dressings given in ten years, the whole comes to eleven shillings per acre per annum. The expense of laying on the manure is a mere trifle. A common wagon carries enough for six acres at one load; and one man sows by hand, broadcast, three tons of rape dust in one day, with which he covers nine acres, and for which the usual pay is one shilling a ton or fourpence the acre. The Holkham horse machine, for sowing rape dust broadcast, is more expensive than the hand process; but it spreads the manure more regularly, and is more expeditious. It is particularly calculated for large farms.

Second Rotation.

Cropping for the second class of land.

A Four and a Five alternate Course Shift.—The occupier uses his discretion in having any particular part of the farm in a four course, and other parts in a five course, so that, "on the whole, he has not, in any one year, more than four-ninth parts of the said arable lands, under crops of corn, grain, or pulse."

The four crops on land of the second class, are, 1. Turnips well manured, and all or nearly all the crop eaten upon the ground;—2. Barley;—3. Red clover, mown once, the second crop sheep-folded, and if a weak crop, the stubble is mucked, or oil caked for the succeeding crop;—4. Wheat.

The Five Course.—1. Turnips well manured, and all, or nearly all the crop eaten upon the ground;—2. Barley;—3. Mixed grasses, mown once;—4. Pasture;—Wheat with manure. In the nine years, the land is manured three or four times, exclusive of the sheep-fold: and produces two crop of turnips, two of barley, two of wheat, one of clover hay, one of mixed grass hay, and one year's pasture.

Two years grass' layers upon light land, are liable to be stocked with wire-worms. Where that misfortune is apprehended, it is advisable to *reece-balk* the land in preparation for the wheat crop. The reece-balking, or rib-balking, is done soon after midsummer, and is performed by a common wheel plough with a broad-winged share. The land is only half broken; the turf or flag in the alternate rib, being skimmed off about two inches deep, and thrown flat on its back, the grass side down upon the unbroken ground. The effect of this practice is, that the wire-worms and grubs creep to the outsides of the ribs, and are eagerly picked up by the rooks. Those sagacious, useful birds, are generally in close attendance when wire-worms and other destructive insects are plentiful. Gamekeepers raise a hue and cry against rooks, pretending, that they destroy the eggs of pheasants and partridges. Those people are generally more attentive to the raising of rabbits, than they are to the preservation of birds; and the poor rooks are a convenient apology for the deficiency of game. When there are no rooks, the gamekeepers attach the blame to the cuckoo, to unfavorable weather, &c. &c. &c.

There is no loss in pasturage, from reece-balking two year's layers upon light land. The spring feed is eaten off before the ground is broken, and the grass grows vigorously afterwards, from the sides of the furrows in the ribs, and produces more good sheep feed than if the turf had not been disturbed. In the autumn, the broken turf is harrowed across the ribs, and drawn into the spaces from whence it was cut. The turf on the unbroken ground is also tendered, or half rotten by the time, from the broken turf having lain upon it, and thence excluding the air. The ground is then manured all over, generally with rape cake *in cobble*, and in the proportion of about a ton to three acres. The ground is immediately ploughed at the usual pitch, considerably deeper than the reece-balking, and the broken turf effectually covered. The wheat seed is thus drilled in at a proper season.

When wheat is sown on light land, upon two years' *alland*, or layers unbroken, it is apt to suf-

fer in winter, not only from the depredations of wire-worms, but also from the frost heaving up the turf, and breaking the roots of the plants. Rolling and treading are good preventives.

Third Rotation.

The third class of land is thus cropped.

The Five Course.—1. Turnips well manured, and all the crop eaten upon the ground by mixed stock; the treading of neat cattle, along with the sheep, in such cases, is greatly beneficial to very light land;—2. Barley;—3. Mixed grasses pastured;—4. Pasture;—5. Wheat highly manured, or oats without manure.

Fourth Rotation.

There is a fourth class of light land in West Norfolk, still inferior, which is occasionally cultivated, and at other times used as sheep pasture and rabbit warrens. That land, when broken up, is usually pared and burned, and sown with rape for the first crop;—2. Rye or oats;—3. Turnips well manured, and all the crop eaten upon the ground by mixed stock. Other food being given to the stock at the same time, in cribs and troughs placed on wheels, and frequently shifted upon the turnip ground; a most commendable practice, and peculiarly suitable for all poor light soils. 4. Barley, well seeded with white clover, narrow-leaved ribgrass, and other permanent grasses;—5. Pastured, and so continued for a series of years, until the moss plants overcome the grasses; when the ground is again broken up, and undergoes a course of aration as before.

In the description here given, of the various rotations of cropping and manuring, no mention has been made of the application of calcareous substances. On that subject, it is only necessary to observe, that an intelligent and attentive farmer, does not require a chemical analysis of the soil, to direct him when calcareous manures ought to be applied. Experience, founded on common sense, is his unerring guide; he knows, that the cultivated soil requires a dressing of calcareous matter, when he sees his crops become proportionably more productive of straw than of corn. When the straw, particularly that of barley, becomes soft and feeble, or, as it is called, "lazy," and bends down, and knuckles under the weight of the ear—when the scythe in mowing, rather breaks than cuts it—also when the land shows an unusual disposition to produce annual weeds, such as the corn marygold, &c. these are certain indications, that the cultivated soil is deficient in a due proportion of lime. The subsoil dressing is usually laid upon wheat stubble, in preparation for turnips; also, upon two years' layers, in preparation for wheat, and sometimes upon young clover, immediately after the barley is carried off, and the harvest is over.

For the Farmers' Register.

COMMERCIAL REPORT.

The business of the present year has been very favorable to the interests of the farmers and planters of Virginia, and indeed, of the Union generally.

The price of tobacco, which may be considered the great article of export from Virginia, has been higher than for several previous years; and although some decline has recently taken place, so small a portion of the crop remained in the hands of the planters, that their interests have suffered little by the reduction in price, while the large crop produced has added greatly to the aggregate sum obtained from this source.

It appears that about 42,000 hhds. were inspected in Virginia up to August 1st, being 6,500 hhds. more than the year's inspection to October 1st, 1834; but as the facilities of getting it to market have been greater this year, there may be less received during August and September, than in the corresponding months of last year. Besides this increase in Virginia, there were 10,000 hhds. more received at New Orleans this, than last season—say 34,200 against 24,200 to 1st of August, 1834.

The price of the lowest quality, in the Richmond and Petersburg markets, has scarcely been under $6, during the last two months—and from this price up to $12, the great mass of sales have been made. At present the latter price is not exceeded, except for such as is peculiarly adapted to the use of certain manufacturers at home.

The markets in Europe might, without any considerable decline in price, bear the large addition which they will receive to their diminished stocks, but that the prospects of the growing crop are so favorable as to excite some apprehension of an over-supply next year; and therefore a continuance of present prices during another season is very improbable.

Something has been said of a change in the regulations of France concerning this article, and it is very desirable that it should be placed on the same footing as other articles of commerce, to be freely bought and sold, instead of the government reserving to itself the exclusive right to sell a segar, or a pinch of snuff. The liberation of the trade however, is not soon to be expected.

It is ascertained with some approach to accuracy, that the crop of cotton produced in the United States last year, was between 1,238,000 and 1,242,000 bales, an increase of about 35,000 bales on that of the year previous, although the crops of the Atlantic States were very unproductive. About 980,000 bales have been shipped to Europe, and 200,000 consumed in this country. The price has not varied essentially during the last two months, varying from 17 to 19 cents. The cultivation of this article has produced a rapid increase in the wealth and population of the South-Western States, and an immense emigration to them continues to proceed from the Carolinas and Virginia. The present year's crop, if not affected by early frosts, will be much larger than any previous one, and may prove that the growth can overtake the consumption.

The price of wheat has disappointed the expectations of the farmers; for although the crop is short, and the quality generally good, the price is lower than last year. The millers have ceased their unprofitable competition, and the markets of New York, Pennsylvania, Maryland, and Virginia, are about on a par. Wheat may be quoted $1.15 to $1.25 cents.

Among the recent importations at New York, are wheat from Ireland, and beans from Trieste—

the former paying a duty of 25 cents per bushel. Large shipments would have been made to this country had the price of wheat advanced to $1.50 per bushel.

The crop in all the Atlantic States is generally estimated to be considerably less than an average product.

Corn had reached a high price ($5.50 to $6 per barrel,) a few weeks ago, but has declined to $3.75 to $4. The prospect of the growing crop is favorable beyond precedent, and there is no doubt that corn will be cheaper the ensuing season than it has been for many years. The abundance of this article insures that of others of the first necessity.

Money has been abundant—Stocks of every description command good prices. Loans for purposes of internal improvement are readily obtained on favorable terms. Rail roads are extending in every state, save one, and hopes are entertained that this one (a southern neighbor,) will not long remain an exception.

x.

Aug. 22, 1835.

EXTRACTS OF PRIVATE CORRESPONDENCE.

——— (*Western Penn.*) *July* 12, 1835.

In this section of the country we are in the back ground. Our land is the best—the markets latterly very good—the climate and water unsurpassed—but yet there does not exist that spirit of improvement, which is developing itself daily in other sections of the country. I attribute the torpidity to the *almost entire absence of agricultural publications among our farmers*, and their total want of information on the science of agriculture. I have actually seen *stables removed to get out of the road of the manure*, and have seen farmers (professedly,) *throwing the manure from the hog-pens into the streets*. I will give you an anecdote illustrative of the spirit of improvement with which we are favored. A Quaker from the lower counties was visiting this section of Pennsylvania; and a farmer wishing to show all the conveniencies of his plantation, directed the attention of the Quaker to an improved plan he had in execution for removing manure from his stables; which was by a run of some magnitude, which he carried to his stable door, and which from the rapidity of the current, carried off the troublesome trash fast as it was thrown into it! Do we not need a more general dissemination of information among the agricultural portion of our community?

—

King William Co. Aug. 5, 1835.

This year I have three acres in Guinea grass, which having been once cut for green food, the second crop is now securing for winter provender, believing from an experiment of last year, it will be found a profitable adjunct to our provisions. Two other cuttings may safely be calculated on.

After much doubt whether the gama grass could be advantageously raised here, my conclusion is, that the greatest difficulty arises from obtaining the first plants from seed; after that is effected, other lands may speedily be covered with sets, to any extent, and with but little labor.

Fauquier Springs, Aug. 20, 1835.

I learned on my way up here, that the wheat I sent you along with the Turkey wheat, is simply called *blue wheat*, and that it was brought from Ohio by a gentleman of Hanover. I know not whether the misnomer originated with me or with some friend from whom I received a description of the wheat. It is a very inconsiderable affair at any rate; but I had always rather correct my own errors than have it done for me by another.

—

Warwick Co. Va. Aug. 12, 1835.

In this county, so far as I have the opportunity of judging, the activity of farmers increases as time rolls on. Those who have marl busily employ the time allotted to such work, in carting and spreading it over the land—others who have not, are beginning to make use of lime, oyster shells in a decomposed state from the river banks, woods' litter, &c. &c. We begin to sow clover here for improvement. It is a late thing, and owes its adoption here to the introduction of the Farmers' Register. Those who have adopted the four-field system, as recommended in your Register, (corn, wheat, clover, wheat,) look forward with great expectation of success, both in improvement and profit. Our crops of corn are very promising.

SEASON AND STATE OF CROPS.

There has been no drought in August, of which there was fear, and on the contrary, as much rain as was desirable for the growing crops. Of course the previous fine appearance of corn continues, and may now be considered as assuring a very good crop—it being now safe from drought, and every other casualty except of freshets on low grounds. But farmers are as apt to be too sanguine, as too desponding—and as we endeavored to moderate the excess of despondency respecting the loss in the wheat crop, and the hope of a very high price for the quantity made, we now express the opinion that the corn crop will not yield in proportion to its appearance, and still less in accordance with the general and exaggerated anticipations. The whole growing season has been unusually wet for the climate of lower Virginia—and though apparently not injuriously wet, it will be seen that the unusual growth of corn is more in the stalk and leaf, than in the grain—which we believe is always the case in wet seasons, with regard to every crop.

In wet seasons, all crops run more into blade—and in dry, the grain is better made than is promised by the parched and stinted appearance of the entire plants. When any region has generally and decidedly a moist, or a dry climate, the truth of this opinion is made too plain to be mistaken: if wet, it is a country good for grass, or for crops of which it is desirable to increase the general bulk, without regard to the seeds—and if dry, it is more profitable for grain crops, or those of which the *seeds* are by far the most important product.

The season has been good for clover, especially for the second growth. The land under clover throughout August has been in sufficiently good order for ploughing, and the whole season for fallowing for wheat may be counted on as decidedly favorable.

No moth weevil yet seen in the wheat, or in old corn. The unusual severity of last winter served to destroy nearly all of those which, if spared, would as usual, have produced a progeny of millions, by this time. This rare exemption is precisely in accordance with the views presented in the article on moth weevil in Vol. I p. 325, and furnishes strong confirmation, in one respect, of the correctness of the opinions there expressed of the nature and habits of this insect, and the means of preventing its ravages. Still we have not learned that the piece referred to has attracted any notice, or produced the least benefit to the public. The wheat crops in parts of France, during the last, and some preceding years, have suffered so much from the ravages of this insect, (there called *"alucite des grains,"*) that a prize has been offered for the discovery of means for checking them.

In general, the condition and prospects of farmers in Virginia were never better than now: and if there was no western country—no Texas—no distant region of which only the *good* is known, and the *ill* never heard of, until too late—which like the fabulous "happy islands," serve to make us first despise, and then abandon our blessings at home—there would be few countries which would yield more profit for cultivation, or be more susceptible of cheap, certain, and sure improvement.

NOTICES TO SUBSCRIBERS.

Remittances for subscriptions are often made, designated by mistake for a wrong volume. In some cases, the writers have supposed their previous payments to have reached a year beyond the fact—but more frequently, money has been sent to discharge the subscription for a volume already paid for, and forgotten by the subscriber. To avoid the trouble of two more letters being written for the correction of every such mistake, (as has often been done heretofore,) our future course will be to give no other notice than will appear from the regularly published receipt lists. Every subscriber who has sent a payment within the previous month, will find it there credited *for the volume or volumes, for which it should be, according to our account.* If any credit is found for a different volume from what was expected, the payer is requested to examine whether the error was in his own recollection, or in our account—and if the latter, to give immediate information, and the mistake will be promptly and readily corrected. Our own accounts, with every care used, cannot be kept entirely free from errors—but every facility is afforded for their detection, and early information for the purpose is always thankfully received. For information then of the existence of their own previous mistakes, as well as of any that we may hereafter be guilty of, all subscribers are again requested to look particularly to the statements of their payments on the receipt lists, and to give notice of all omissions, or improper insertions.

COLLECTING AGENTS.

Messrs. Robert and N. B. Hill of King William, are appointed collecting agents for this publication. This arrangement need not prevent any one, previously to being called on personally by an agent, making remittance by mail, as heretofore directed. It will necessarily sometimes happen that such application will be made after the subscriber has paid directly to the editor, and before there has been time for the receipt to be published on the next cover. In such cases, the subscriber's statement will be satisfactory to the agent—and it is hoped that the impossibility of preventing such occurrences, except by the appearance of their names on the printed receipt lists, will prevent any subscriber's taking offence at applications thus improperly made.

Credits for payments made to agents cannot appear promptly or regularly in the printed receipt lists—but will be placed there as soon and as often as made practicable by settlements between the publisher and agents. In the mean time, the agents' receipts will be held by those whose printed receipts are thus necessarily delayed.

Since the printing of the first half of this No. which included the remarks of T. B. A. and his inquiry for information respecting liming, we have received in the June No. of the *Annales de l'Agriculture Francaise*, the conclusion of a long communication on that subject, and can now present to our readers the translation, which we hope will be not only interesting but valuable to many. From this piece it appears that the most profitable application of lime, in France, is in compost, and in very small quantities, though repeated in every rotation.

TERMS OF THE FARMERS' REGISTER.

1. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year—payable in advance.

2. Or five *new* subscribers by sending their names and $20 at one time to the editor, will receive their copies for one year, for that sum, or at $4 for each. Purchasers of any 5 volumes (except Vol. I.) at one time in like manner, shall have them for $20.

3. The risk of loss of payments for subscriptions, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor.

4. For all copies not received by mail, duplicates will be furnished to those subscribers who have complied with their own obligations.

5. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some one volume, and will not be taken for less than a year's publication.

6. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued: and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor.